

**Fishery Resources and the State of Exploitation of Some Economic
Fish Species in the South China Sea Area
Case Study : Malaysia and Thai Waters
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MARINE RESOURCES

This section contains a list of some important economical fish species, both pelagic and demersal. There are 18 pelagic and 7 demersal species. These fish are dominant in Malaysian and Thai Waters. The information for each species includes name, characteristics, biological & distribution, fishing gears used and total landing quantities. The total landings are derived from statistical data obtained 1985-1994, also included are minimum, maximum, and average catches, as well as a brief annotation on their state of exploitation and utilization.

Small pelagic fish are generally distributed in the shallow waters of the continental shelf area. These shallow shelf areas, often less than 100 m deep, form the traditional and main fishing grounds for small pelagics in Malaysia. Off the coast of Sarawak, depths exceed 1,000 m just 60 nm to 120 nm offshore, while off the east coast of Sabah, the depth of water exceeds 1,000 m within 18 nm from the shore. These deep sea areas offer potential for the development of fisheries for tuna and large pelagics (Chee, 1989). In Thai Waters, these are scattered along the coastal areas of the Gulf of Thailand and the Andaman Sea.

Pelagic species consume phytoplankton, zooplankton, living and feeding near sea surface and normally gather in schools. Several pelagic species are free swimming, photophiles and migrate between the EEZs of each country and some straddle between contiguous and bordering waters. It is recognized that the major fishing grounds for many important resources are widely spread over the coastal waters of the region. However, intensive fishing areas are generally concentrated in near shore waters in depth of less than 60 m. Fishing of some stocks like coastal tunas and some kinds of mackerels extend further into offshore waters. Some demersal fish in deeper waters are also exploited on coral reefs, but the deeper parts of continental shelves generally remain unused.

It is thought that the concentration of fishing in many near shore waters in the region may be the result of the small-scale nature of the local fisheries, which depend heavily on the coast or shallower sea bottom. The availability of resources decreases, naturally as sea depth increases. The estimated potential yield of demersal and trash fish in the Gulf of Thailand was 136,300 and 615,800 tons respectively (FAO, 1996) while the potential yield of pelagic, demersal and trash fishes in the Andaman Sea was 136,602; 17,758 and 179,861 tons respectively (Bhatiyasevi, 1997). Gambang (1994) reported that the total biomass for pelagic fish outside 12 nm offshore of Sarawak, Malaysia was estimated at 216,300 tons giving a potential yield of 108,150 tons and assessment of coastal resources for trawlers catch showed that the MSY was estimated at 38,000 tons.

It expresses that many stocks of important economical pelagic species in Thai Waters have been fully exploited and there are signs of stock depletion of the round Scad resources in the Gulf of Thailand. Therefore, the fishermen have changed their fisheries to fish according to the market demand. In Malaysian Waters, there is an indication that the tuna and mackerel fisheries in Sabah are declining while most of small pelagic fisheries in Sarawak are underexploited. For the Malacca Strait, west coast of peninsular Malaysia, an indication of severe coastal overfishing is the high proportion of trawl catches that are composed of trash fish. However, more studies are needed to confirm this finding.

Brief notes describing the criteria and symbols used in the following section are provided below.

Explanation notes

1. Data Collection

The data compiled in this paper are for economic fish species, important in Southeast Asia Region especially Malaysia and Thailand. The total catches of each species is expressed in tons and from both of small-scale (artisanal) fishery and large scale (commercial) fishery. The main sources of biological parameters are collected from the scientific paper of each country. The catches and landing information are :

- Fishery statistical bulletin for the South China Sea Area which prepared by SEAFDEC (Training Department, Southeast Asian Fisheries Development Center).
- Annual fisheries statistics of Malaysia.
- The marine fisheries statistics of Thailand.

2. Country and sub-areas

Countries and sub-areas to be used in capture fisheries statistics and thier stocks are as follows :

1. Malaysia : MAL

- | | |
|--|-------|
| 1.1 Western Coast of Peninsular Malaysia | : WPM |
| 1.2 Eastern Coast of Peninsular Malaysia | : EPM |
| 1.3 Sabah | : SAB |
| 1.4 Sarawak | : SAR |

2. Thailand :THA

- | | |
|----------------------|-------|
| 2.1 Gulf of Thailand | : GOT |
| 2.2 Andaman Sea | : ADS |





3. State of exploitation

The state of exploitation as shown by the abbreviations below represents the estimate of the state of the stock, its potential for increased production or requirement for stock recovery. The estimates are based on the best information available, which may include the results of peer-reviewed published reports as well as the analysis of qualitative data and information whose reliability may vary from one to another as well as between stocks or groups of the same or different species within the same area. These data are collected from scientific papers and fisheries statistical data. The state of exploitation of each fish stock are as follows:-

- R : Recovering. Catches are again increasing after a collapse from a previous high;
- D : Depleted. Catches are well below historical level, irrespective of the amount of fishing effort exerted;
- O : Overexploited. The fishery is being exploited at above a level which is belived to be sustainable in the long term, with no potential room for further expansion and a higher risk of stock depletion/collapse;
- F : Fully exploitated. The fishery is operating at or close to an optimal yield level, with no expected room for further expansion;
- M : Moderately exploited, exploited with a low level of fishing effort. Believed to have some limited potential for expansion in total production;
- U : Underexploited, endeveloped or new fishery. Belived to have a significant potential for expansion in total production;
- ? : Not known or uncertain. Not much information is available to make a judgment.

The map and symbols used in area distribution in the following section are given belows :-



-  : Main fishing area
-  : Areas of distribution
-  : Areas of abundance
-  : Known spawning areas

4. Utilization

The utilization of each fish species are based on the following groups of commodities for human consumption in each countries.

Disposition	Type of commodity products
Live Fish	Live products : live for human consumption, fry and fingerling for aquaculture.
Fresh Fish	Fresh products : fresh, chilled or iced, round or dressed, fish fillets, cutlets, etc., for human consumption.
Frozen	Frozen products : frozen, round or dressed, fish fillets, cutlets, etc.
Canned	Canned products : processed and sealed hermetically in can containers.
Dried	Dried products : commonly described as salted dried products, e.g. dried fish/shrimp/squid, etc.
Smoked	Smoked products : smoked fish, etc.
Boiled	Boiled products : processed either by cooking in boiling water or in steam.
Fermented	Fermented products : fermented fish, fish paste, fish sauce, etc.
Cured	Cured products : processed by pickling or salting without drying, e.g. cured fish.
Comminuted	Comminuted products : 1. Frozen surimi 2. Other comminuted products : fish products, fish balls, fish cakes, fish sausages and burgers, etc.
Reduction	Fish oils, : edible and inedible oils, fish meals and fertilizers.
Powdered/flaked	Powdered products : fish floss, granulated or flaked products.
Others	Other fish products : include crackers made from fishes barbecued fish (satay), and products not described above.

5. Reference

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Family : Carangidae

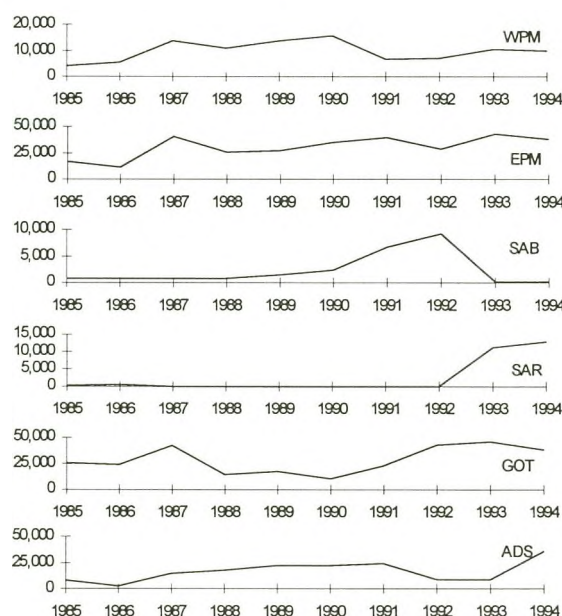
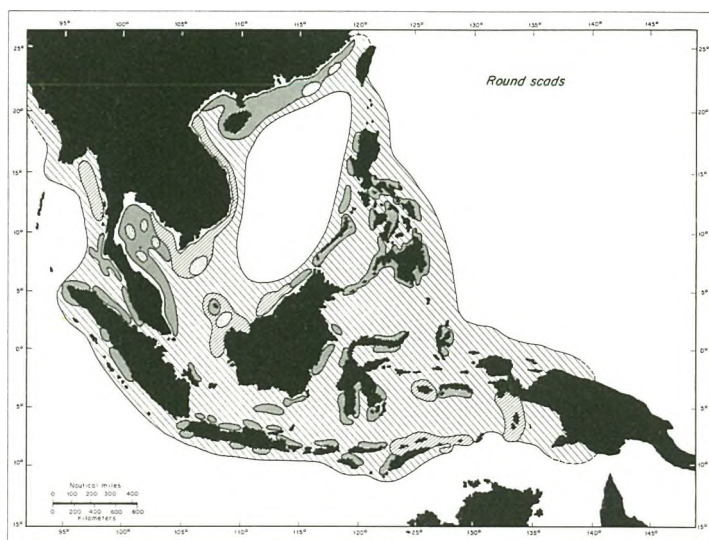
Species name : *Decapterus macrosoma* (Bleeker, 1851)

Characteristic : Body very elongate, slender and nearly rounded. Scales on top of head do not extent forward to beyond posterior margin of pupil; terminal dorsal and anal soft rays each consisting of a widely detached finlet; pectoral fin short; stright part with 14 to 29 scales, followed by 24 to 40 scutes. Colour: metallic blue above, silvery below; small black blotch on margin of opercle near upper edge. Caudal fin hyaline to dusky fins mostly pale. And *Decapterus russelli* (Ruppell, 1830) Body elongate, moderately slender and slightly compressed. Terminal dorsal and anal soft rays each consisting of a widely detached finlet. Total scales and scutes in lateral line 77 to 102. Colour: bluish-green above, silvery below; small black blotch on margin of opercle near upper edge. Caudal fin hyaline to dusky brown.



Biological and Distribution : *D. macrosoma*; *D. dayi* and *D. killiche* are the most common species in Thai Waters while *D. russelli*, *D. macrosoma* and *D. maruadsi* are dominant in Malaysia Waters. Pelagic, coastal, common throughout the year and widely distributed in the deep waters including the western Indian Ocean and western Pacific Ocean. They schooling species found normally down to 30 m. Feeds on pelagic, zooplankton and bottom-living animals. Usual size 15 - 30 cm, attains 45 cm.

Fishing gears : The main fishing gear is purse seine (Luring purse seine for Thailand or papao in Philippines). Caught by lift net in East Coast of West Malaysia, also with trawl. Trawl, South China Sea, 63 - 65 m.

**State of exploitation :**

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	5,334	11,098	114	118	10,676	2,464
Maximum catches (tons)	15,558	42,610	9,143	12,954	41,842	35,994
Average catches	9,730	30,398	2,296	2,518	28,326	16,482
MSY (tons)		53,882			29,280	15,728
State of exploitation	?	U	M	?	O	M

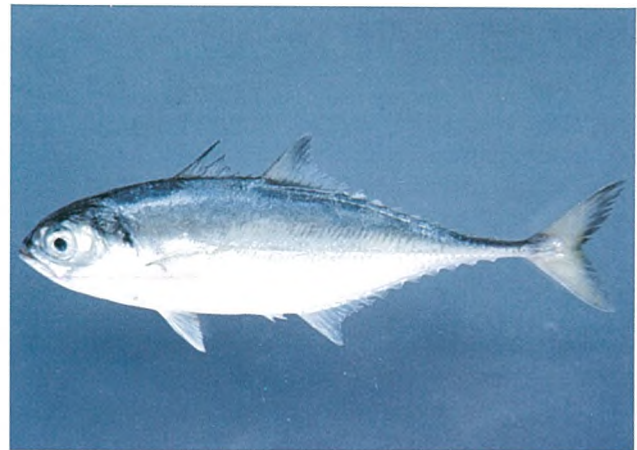
Utilization : Canned, Smoked, Boiled, Cured, Fish dried, Fish bait, Marketed fresh.

Sources : Anon, 1978.; Bhatiyasevi, 1997.; FAO, 1974a.; MFRD, 1996a., 1996b.; Mansor & Abdullah, 1995.; and Saikliang & Boonragasa, 1997.

Family : Carangidae

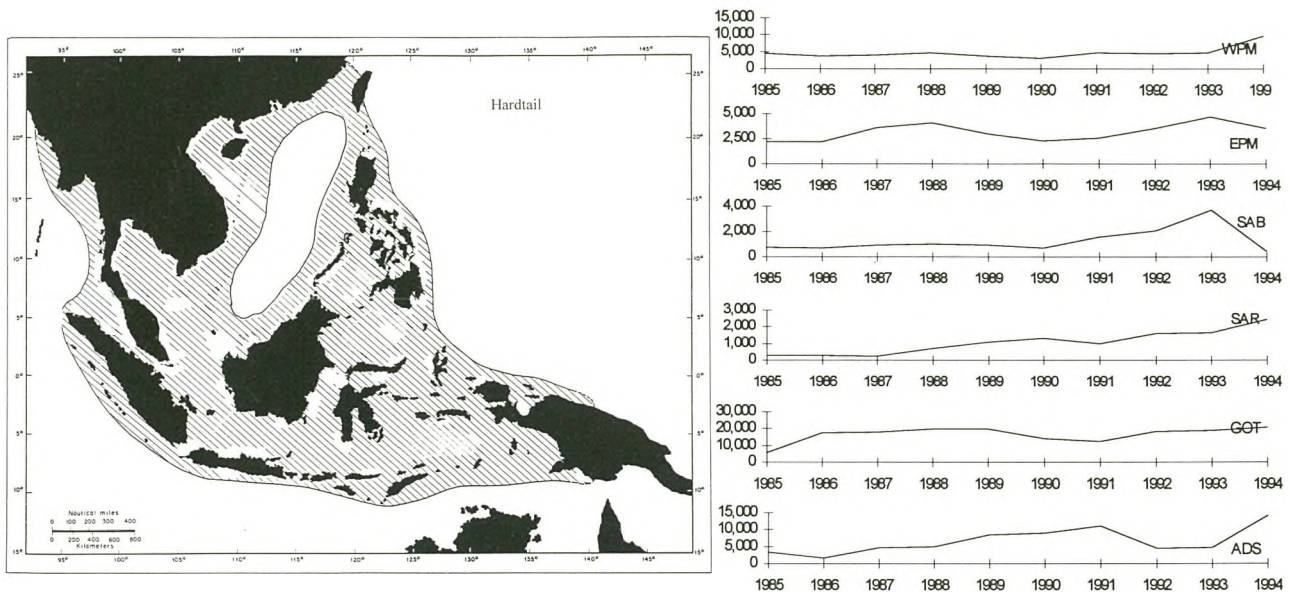
Species name : *Megalaspis cordyla* (Linnaeus,1758)

Characteristic : Body elongate, subcylindrical, with caudal peduncle strongly compressed with a marked medial keel; snout and lower jaw pointed. Eye moderate, with well developed adipose eyelid completely covering eye except for a vertical slit centred on pupil, posterior 7 to 9 rays of second dorsal and 8-10 of anal consisting of detached finlets. Colour: head and body bluish-grey to green dorsally, sides and belly silvery; large black opercular spot. Dorsal and anal fins pale to yellow, distally dusky; pectoral and pelvic.



Biological and Distribution : One of the most common fishes in the market, caught in great numbers along the coast of West Malaysia. Usual size 25 - 30 cm, attains 50 cm. Feeds on small crustaceans and fishes.

Fishing gears : The main fishing gear is king mackerel drift gill nets, purse seines and lift nets. Trawl, North Andaman Sea, 38 - 39 m.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	3,061	2,149	414	211	5,706	1,738
Maximum catches (tons)	9,670	4,699	3,715	2,423	20,532	14,143
Average catches (tons)	4,718	3,152	1,270	1,054	16,373	6,620
MSY (tons)					18,433	
State of exploitation	?	?	?	?	O	U

Utilization : Dried, Popular food fish, Salted fish, BBQ

Sources : FAO, 1974a., MFRD, 1996a., 1996b.; and Saikliang & Boonragsa, 1997.

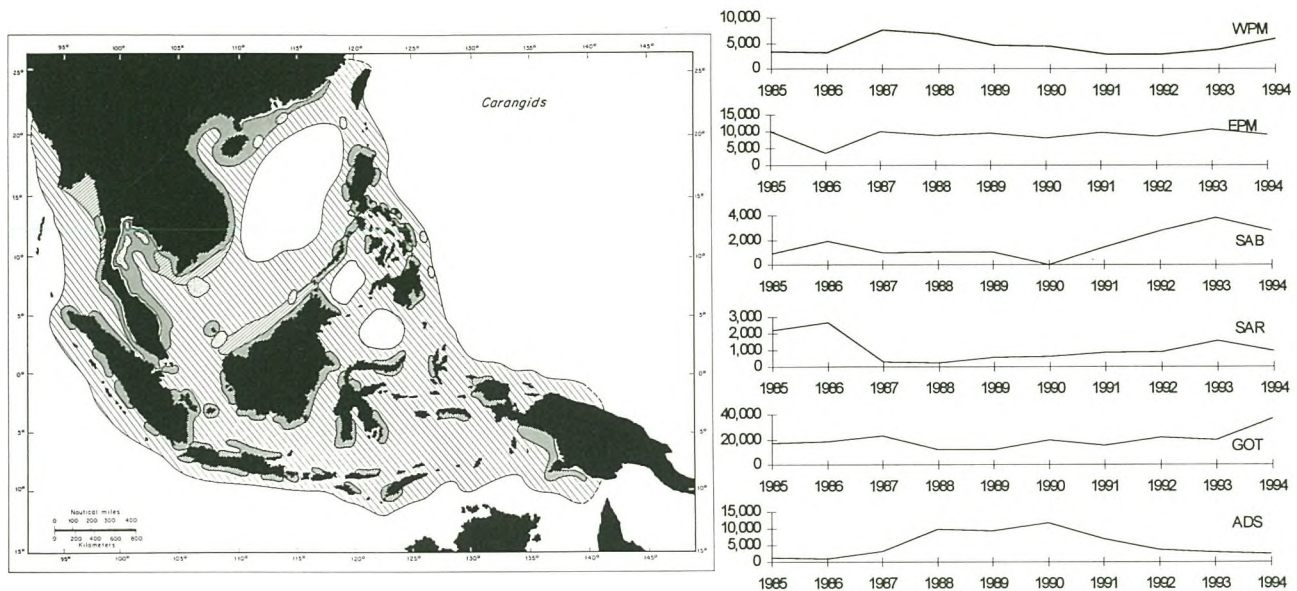
Family : Carangidae**Species name :** *Selar crumenophthalmus* (Bloch,1793)

Characteristic : Body elongate and moderately compressed, with lower profile slightly more convex than upper. Eye very large, with a well developed adipose eyelid completely covering eye except for a vertical slit centred on pupil. Dorsal and anal fins without a detached terminal finlet; pectoral fins shorter than head straight part with 29 to 42 scutes; total scales and scutes in lateral line (excluding caudal scales) 84 to 94. Colour: upper third of body and top of head metallic blue or bluish-green; tip of snout dusky or blackish; lower two thirds of body and head silvery or whitish; a narrow, yellowish stripe may be present from edge of opercle to upper part of caudal peduncle. First dorsal fin dusky on margins with rest of fin clear.



Biological and Distribution : It is abundant and widely distributed in the offshore waters. Inhabits coastal areas down to 80 m. Feeds on crustacean and fishes.

Fishing gears : The main fishing gear is purse seines and a substantial quantities has been caught by trawl nets. Common size 20 cm, attains 30 cm. Trawl, South China Sea, 63 - 65 m.

**State of exploitation :**

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	2,848	3,494	918	279	11,931	881
Maximum catches (tons)	7,641	10,807	3,801	2,665	37,080	11,614
Average catches (tons)	4,534	8,842	1,645	1,087	19,981	5,162
MSY (tons)		20,823			18,500	
State of exploitation	?	M	?	?	F	U

Utilization : Canned, Dried, Smoked, Boiled, Cured, Deep-fried and Marketed fresh.

Sources : FAO. 1974a.; MFRD, 1996a., 1996b.; and Isara, 1993.

Family : Carangidae

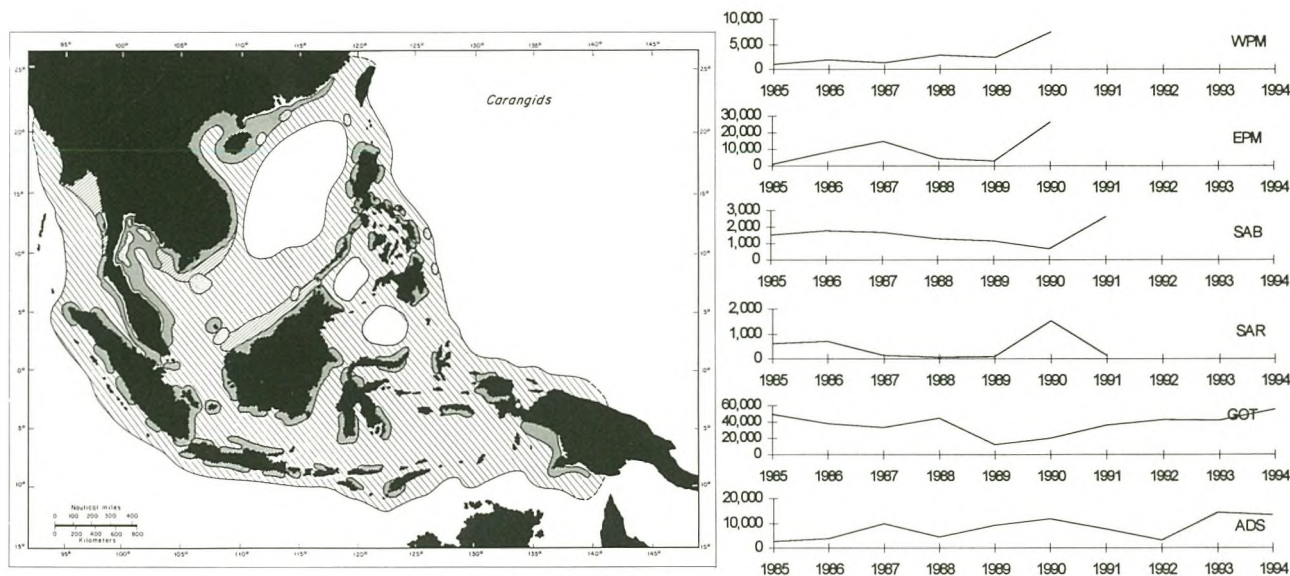
Species name : *Atule mate* (Cuvier, 1833)

Characteristic : The jacks and travellies are characterized in having of lateral scutes or fleshy keel on caudal peduncle; two anal detached spines; long, crescent pectoral fins; body forms highly variable, from fusiform to deeply compressed. Seventeen genera and about 70 species known from Indo-Pacific, 24 species found. References; Gushiken (1983), Smith-Vaniz (1984), Randall (1995). *Atule mate* (Cuvier,1833) is one of dominant species in this region. Body elongate oval, moderately compressed, with dorsal and ventral profiles almost evenly convex; snout pointed. Adipose eyelid well developed and completely covering eye except for a vertical slit centred on pupil, terminal dorsal and anal rays finlet-like in adults. Lateral line gently arched anteriorly, with junction of curved and straight parts below second dorsal fin below 6th to 8th soft rays; total scales and scutes in lateral line (extending caudal scales) 92 to 103. Colour: bright olive-green dorsally, yellowish-green laterally and whitish ventrally; dorsolaterally 9 or 10 faint, grey bars, wider than pale interspaces. A black spot, slightly smaller than eye, on upper margin of opercle.



Biological and Distribution : Very common fish in coastal waters and trawling grounds. Usual size 15-17 cm, attains 25 cm.

Fishing gears : Caught by purse seines and trawlers. Trawl, South China Sea, 63 - 65 m.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	916	1,168	678	67	12,063	2,657
Maximum catches (tons)	7,446	26,023	2,628	1,523	55,616	14,304
Average catches (tons)	2,805	9,507	1,527	463	37,392	8,003
MSY (tons)						
State of exploitation	?	?	?	?	?	?

Utilization : Canned, Dried, Boiled, Cured.

Sources : MFRD, 1996a., 1996b.

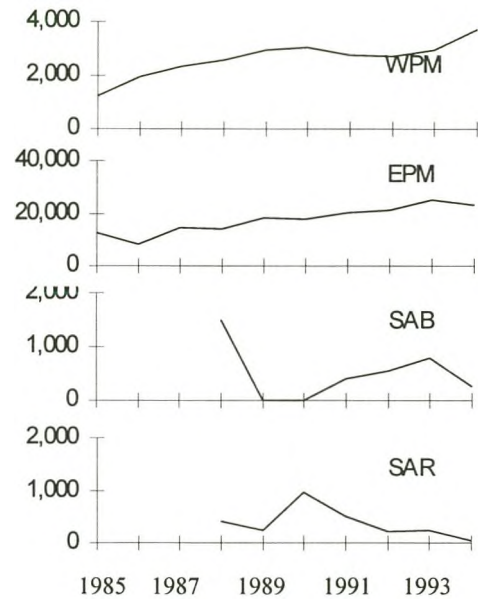
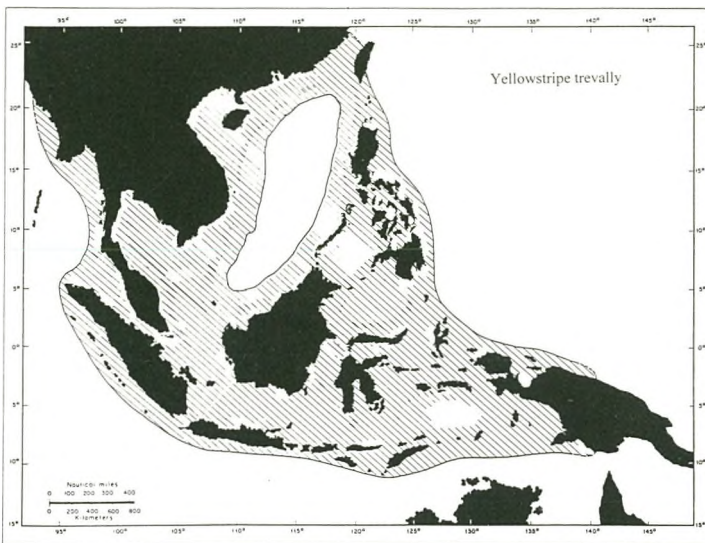
Family : Carangidae

Species name : *Selaroides leptolepis* (Cuvier,1833)

Characteristic : Body elongate, oblong and compressed; dorsal and ventral profiles equally convex. Adipose eyelid moderately developed on posterior half of eye. Chord of curved part of lateral line longer than straight part with 13 to 25 scales. Breast completely scaled. Colour: metallic blue above, silvery white below, with a broad yellow stripe from upper margin of eye to caudal peduncle; prominent black opercular spot encroaching onto shoulder.

Biological and Distribution : One of the most abundant and popular small-sized fish. Throughout most warm coastal waters. Inhabits shallow coastal area. Excellent food fish and as bait for larger fishes. Usual size 15 cm, maximum 20 cm. Feeds on crustacean and presumably also on small fishes. Trawl, South China Sea, 30 - 40 m.

Fishing gears : Purse seines are the main fishing gears. Caught in the east coast of west peninsular Malaysia by lift nets and purse seines in large quantities.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA*	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	1,242	8,238	271	55		
Maximum catches (tons)	3,726	25,128	1,500	955		
Average catches (tons)	2,621	17,564	500	376		
MSY (tons)						
State of exploitation	?	?	?	?	?	?

Utilization : Marketed mostly fresh, Dried, Comminuted, Fish meal

Sources : FAO, 1974a.; and MFRD, 1996a, 1996b.

* Data catches were included in other trevelly.

Family : Carangidae

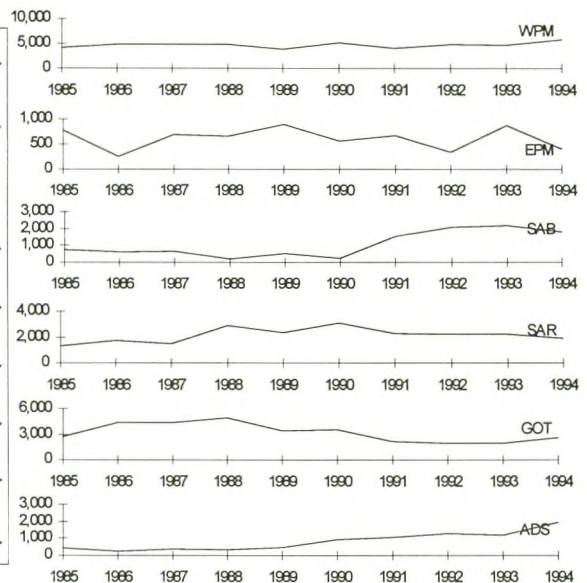
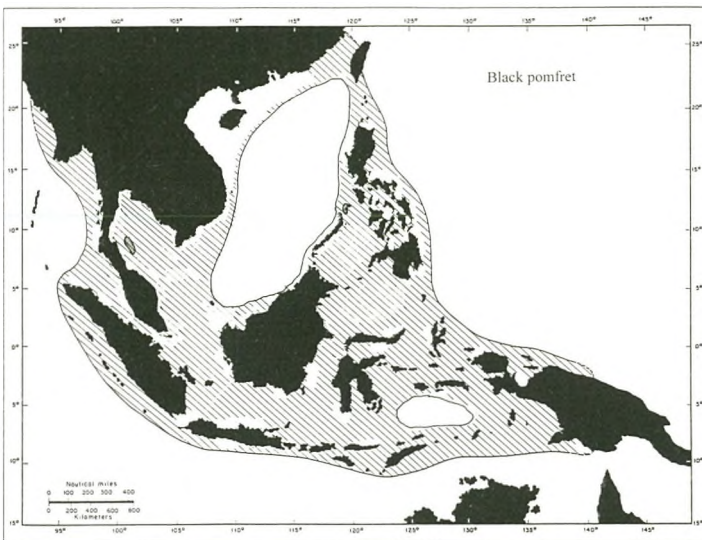
Species name : *Parastromateus niger* (Bloch, 1795)

Characteristics : Body deep and compressed; dorsal and ventral profiles of the body strongly and equally convex. Mouth terminal with upper jaw unrestricted dorsally and ending below and slightly before the anterior margin of the eye. Dorsal fin with 4 or 5 short spines (embedded and not apparent in adults) followed by 1 spine and 41 and 44 soft rays; anal fin with 2 spines followed by 1 spine and 35 to 39 soft rays; profile of second dorsal and anal fins nearly identical, with elevated, broadly rounded anterior lobes; pelvic fins absent in specimens larger than about 10 cm fork length. Pectoral fins long and falcate. Straight part of lateral line with 8 to 19 weak scutes, forming a slight keel on caudal peduncle; scales small and deciduous.



Biology and Distribution : Occurs in shoals in coastal waters especially muddy areas. Feeds predominantly on larger planktonic invertebrates (crustaceans) and small fish.

Fishing gear : The main fishing gear are trawls, king mackerel drift gill nets and gill nets in coastal areas. Trawl, off Sarawak, South China Seas, 47-48 m and North Andaman Sea, 35-35 m.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	3,868	257	200	1,268	1,895	208
Maximum catches (tons)	5,841	889	2,155	3,102	4,902	1,957
Average catches (tons)	4,718	613	1,045	2,142	3,165	814
MSY (tons)						
State of exploitation	?	?	?	?	?	?

Utilization : Marketed fresh, Very common and popular fish in market and always in great demand.

Sources : MFRD, 1996a., 1996b.; and Vithayanon, 1997.

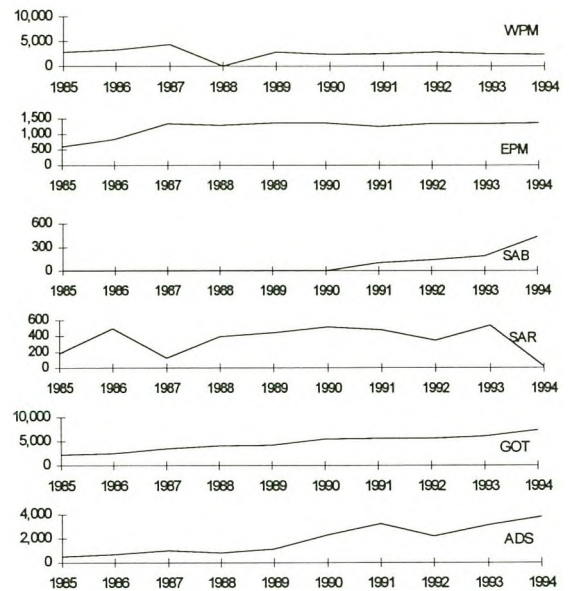
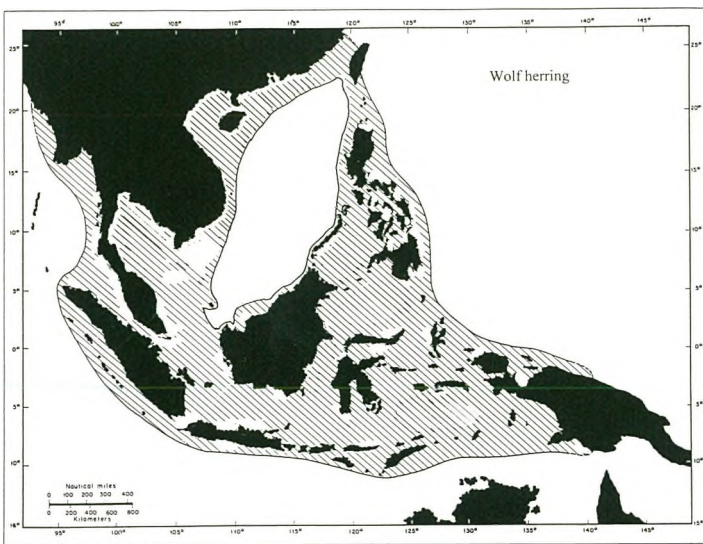
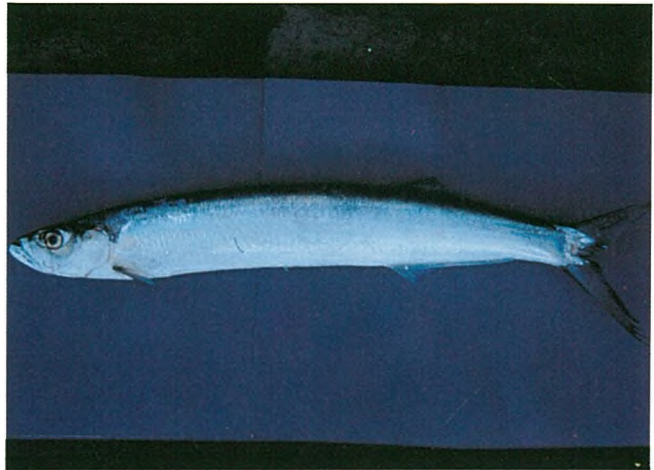
Family : Chirocentridae

Species name : *Chirocentrus dorab* (Forsskal,1775)

Characteristic : Pectoral fin shorter than distant between mid-orbital to edge of opercle and the black marking on the upper part of the dorsal fin, also some black on the anterior part of the anal fin. Size: To about 100 cm of standard length.

Biological and Distribution : Geographical Distribution: throughout the warmer coastal waters from the shore to about 120 m of Indo-Pacific. Common but not abundant, pelagic, carnivorous. Predator, probably feeding on small fishes, crustaceans.

Fishing gears : Caught by floating lines (pelontang) trawl and drift nets. Usual size about 45 cm, may attain 150 cm. Trawl, South China Sea, 30 - 40 m.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	2,326	589	102	19	2,183	491
Maximum catches (tons)	4,301	1,364	431	537	7,352	3,794
Average catches (tons)	2,580	1,200	85	353	4,655	1,884
MSY (tons)						
State of exploitation	?	?	?	?	?	?

Utilization : Deep-fried, Comminuted (making of fish ball, otak-otak, fillet for raw eating), Marketed fresh.

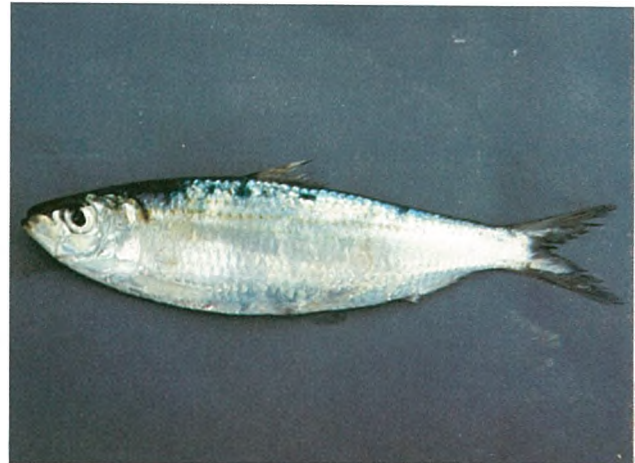
Sources : FAO, 1974a.; and MFRD, 1996a., 1996b.

Family : Clupeidae

Species name : *Sardinella gibbosa* (Bleeker, 1849)

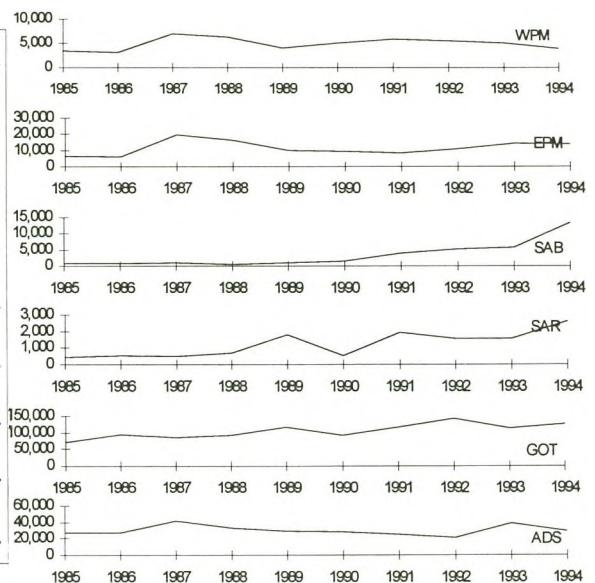
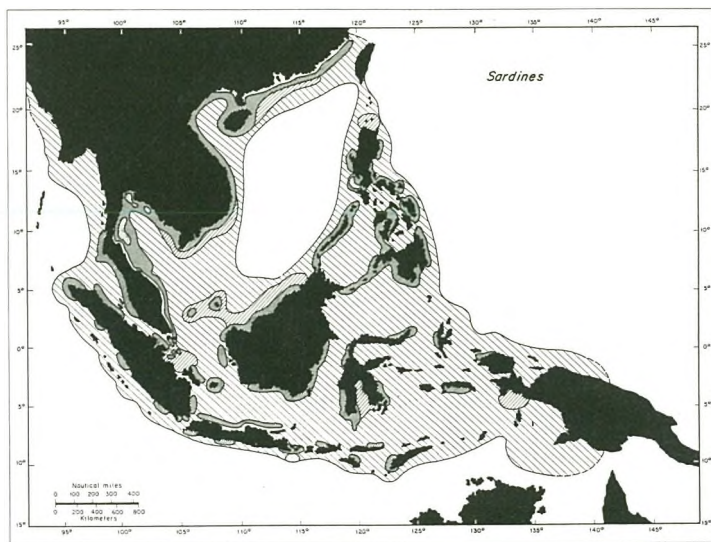
Synonym : *Sardinella jussieu* (Lacepede, 1803)

Characteristic : Body fusiform, a little compressed, its depth 3.6 to 4.1 times in standard length; belly with keel scutes; post-pelvic scutes 15 to 16 (rarely 14 or 17 to 18). Dorsal fin origin slightly before midpoint of body, anal fin base short and lying far behind dorsal fin base, pelvic fins below anterior part of dorsal fin base. Lower gill rakers 43 to 63. Anterior scales with a few perforations and fimbriated at posterior margin.



Biological and Distribution : Distributed in Indo-West Pacific, Inhabits coastal waters, pelagic. Throughout its range, and especially in India, also in Thailand. Its scatter in the coastal and offshore area where the depth range from 30-70 m. The peak of spawning season is during March-April and July-August in the Gulf of Thailand, feeding on phytoplankton. Common: about 15 cm. Goldstriped sardine, fringescale sardine and spotted sardine are most common in Thai Waters.

Fishing gears : The main fishing gear is purse seine (Thai purse seine and Luring purse seine), encircling gill nets, lift nets, set nets and bamboo stake trap.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	3,135	5,998	550	421	70,197	26,657
Maximum catches (tons)	6,959	19,758	13,306	2,597	125,179	41,655
Average catches (tons)	4,898	11,526	3,368	1,213	104,651	30,038
MSY (tons)					110,457	36,228
State of exploitation	?	?	?	?	F-O	U

Utilization : Canned, Dried, Smoked, Boiled, Fermented (Fish sauce), Cured, Fish meal and Marketed fresh.

Sources : FAO, 1974a.; MFRD, 1996a., 1996b.; and Saikliang & Boonragsa, 1997.

Family : Engraulidae

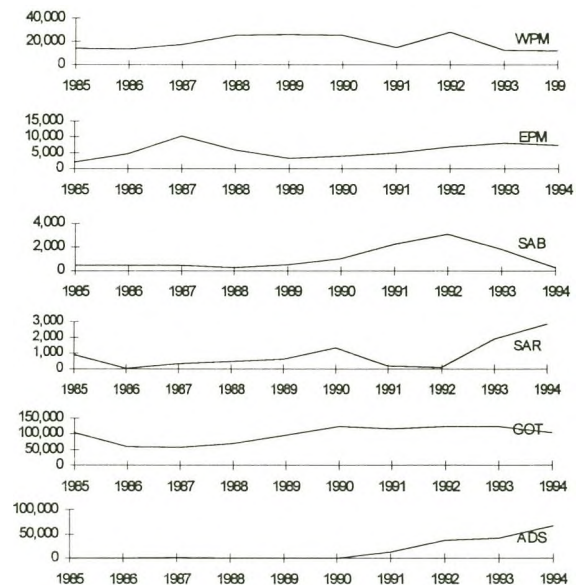
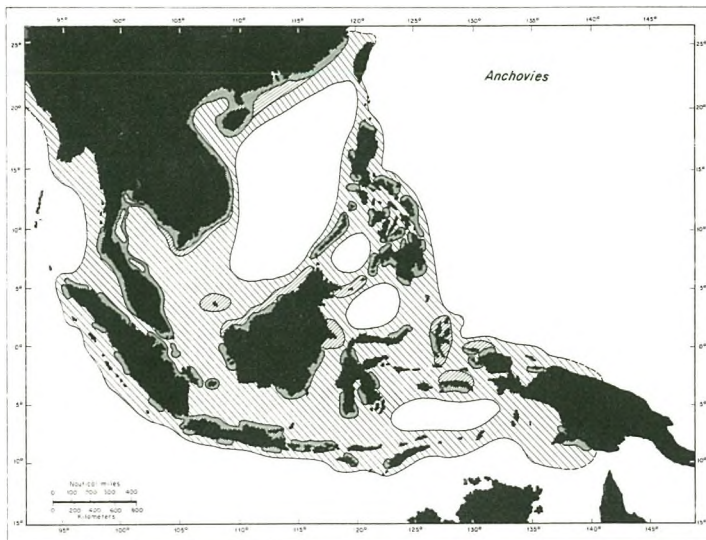
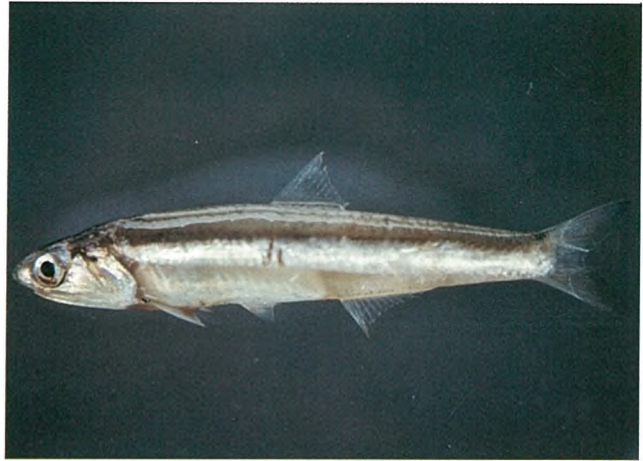
Species name : *Encrasicholina heteroloba* (Ruppell, 1837)

Synonyms : *Stolephorus pseudoheterolobus* Hardenberg, 1933:261 (Riau, Lingga Anhepelago) *Stolephorus hetero-lobus* Munro, 1956:27, fig 186 (north Queensland)

Characteristic : Body rather cylindrical, belly rounded, with 4 to 6 sharp needle-like prepelvic scutes, anal fin begins under last dorsal fin ray. Maxilla tip pointed, projecting beyond second suprmaxilla and reaching to suboperculum. Lower gillrakers 22 to 30, anal fin short, dull silvery/grey band on flank, the back beige.

Biological and Distribution : Both neritic and oceanic, Widespread in Indian Ocean (North of Madagascar, eastward to Bay of Bengal) and equally widespread in western Pacific (Indonesia; Thailand; Malaysia, especially West Coast of Peninsular Malaysia and Philippines) Marine, pelagic and schooling, inshore. Like other species, probably feeds mainly on planktonic crustaceans. Breeds throughout the year, with a peak during the first part of the northeast monsoon in Manila Bay (October to January) and again in September to November, Gulf of Thailand (February to April and July to December; eggs oval, without a knob at one end. In the Gulf of Thailand, 12 species are found in the catch but the most dominant species is *Stolephorus heterolobus* or *Encrasicholina heteroloba* is a species dominant in Thai waters.

Fishing gears : Mainly caught by anchovy purse seine in day or night time operation which light luring, bamboo stake traps, luring lift net, set bag nets, push nets and incidentally in trawl.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	11,982	2,084	232	62	56,356	136
Maximum catches (tons)	28,260	10,209	3,095	2,856	123,751	66,630
Average catches (tons)	18,925	5,712	1,055	876	97,274	16,030
MSY (tons)					106,118	Risking
State of exploitation	M	M	M	M	F	U

Utilization : Fermented (Fish sauce, Boodu sauce); Dried (Cooked in brine and dry, Boiled and dry); Canned; Cured and Fish meal.

Sources : Sidtichokpan, 1972.; FAO, 1974a., 1988., 1997.; MFRD, 1996a., 1996b.; Saikliang, 1995.; and Saikliang & Boonragsa, 1997.

Family : Lutjanidae

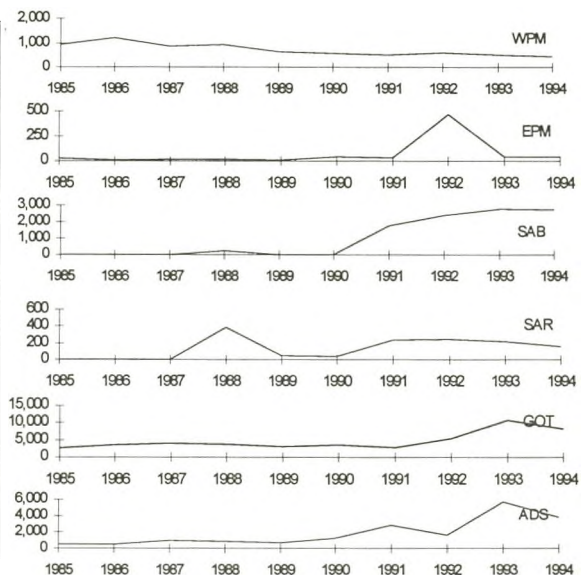
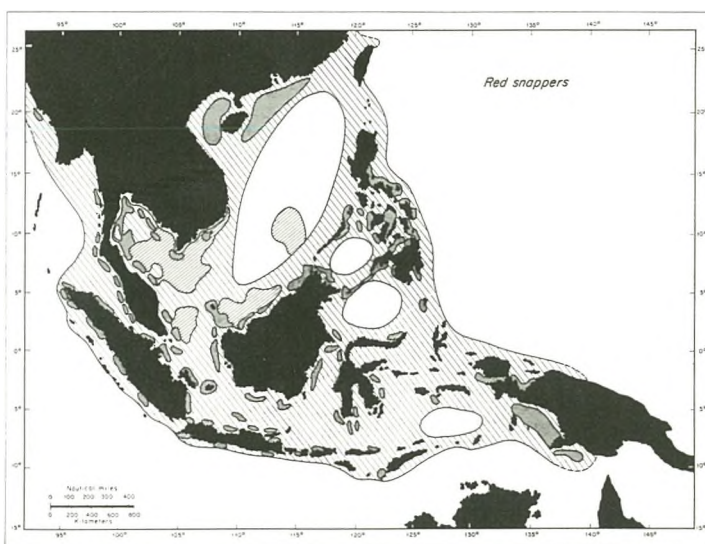
Species name : *Lutjanus sebae* (Cuvier, 1828)

Characteristic : The snappers are distinctive in having moderate large mouth; dorsal fin continuous or weakly notched; body usually compress; jaws with strong canine teeth anteriorly. At least 30 species known in the Indo-Pacific (Allen, 1985; Allen & talbot, 1985), 11 species found. *Lutjanus sebae* (Cuvier,1828): Body very deep. Dorsal profile of head steeply sloped, snout profile straight or slightly convex, posterior profile of dorsal and anal fins distinctly pointed. Scale rows on back rising obliquely above lateral line. Colour: generally red or pink in adults; juveniles and smaller adults pink with a dark red band from first dorsal spine through eye to tip of snout; a second band from middle of spinous part of dorsal fin to pelvic fin; and a third band from base of last dorsal spine running obliquely downward across caudal peduncle and along lower edge of caudal fin. Size: Maximum total length to at least 100 cm; common to 60 cm.



Biological and Distribution : Distributed in Indo-West Pacific. Juveniles inhabit shallow mangrove and seagrass areas; adults are found down to depths of 100 m. Common in trawl catch from South China Sea. Common size about 50 cm. Feeds on crustaceans and bottom-living fishes.

Fishing gears : The main fishing gear is trawler. Also caught with bottom long lines and hand-lines. Trawl, South China Sea, 47 - 49 m.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	434	4	250	38	2,607	467
Maximum catches (tons)	1,213	465	2,740	240	10,815	5,673
Average catches (tons)	716	69	1,406	187	4,764	1,854
MSY (tons)						
State of exploitation	?	?	?	?	?	?

Utilization : Marketed mostly fresh also dried-salted, Frozen, Steamed, pan-fried & deep-fried.

Sources : FAO, 1974b.; and MFRD, 1996a., 1996b.

Family : Mugilidae

Species name : *Liza vaigiensis* (Quoy & Gaimard, 1884)

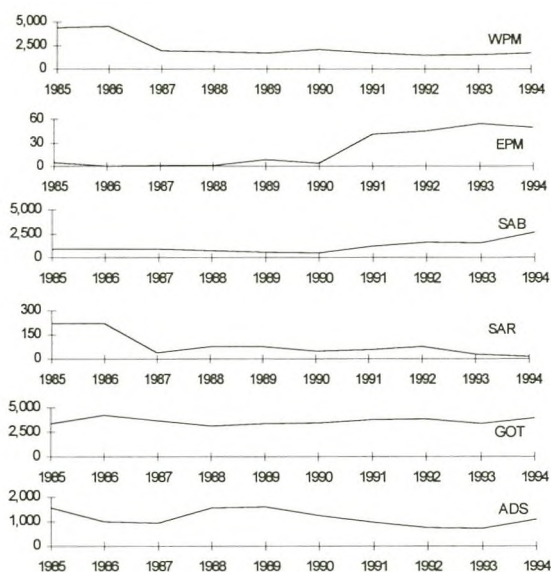
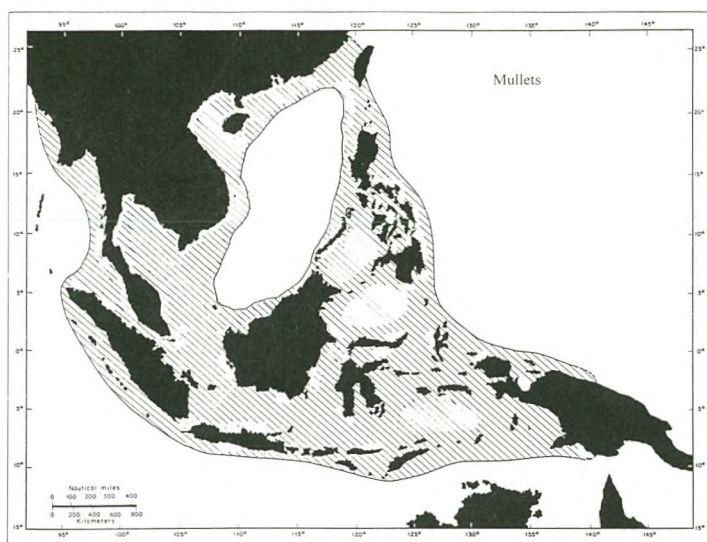
Synonyms : *Mugil vaigiensis* (Quoy & Gaimard, 1884)

Characteristic : Body rather stout, head broad and flattened on top. Upper and lower lips thin; a large symphyseal knob at front of lower jaw; posterior tip of upper jaw strongly curved down and still visible when mouth closed; adults without teeth, juveniles with sparse row of teeth in each lip. Colour : back dark green, flanks lighter, belly silvery; usually 6 longitudinal spotted bands along flanks, the second and fifth the most conspicuous. Pectoral fins blackish, other fins with dusky margins.



Biological and Distribution : Throughout the southeast asian region, schools occur in shallow coastal waters and enter lagoons, estuaries and rivers, the juveniles often occurring in mangrove seaps. Spawning takes place in the sea. Feeds on minute bottom-living organisms and on organic matter in mud and sand; perhaps also on floating algae.

Fishing gears : The main fishing gear is gill nets, beach seines, cast nets and bamboo stake trap, which operates in shallow coastal waters, estuaries and mouths of rivers.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	1,391	1	550	16	3,099	719
Maximum catches (tons)	4,550	54	2,631	220	4,184	1,580
Average catches (tons)	2,259	21	1,131	85	3,585	1,142
MSY (tons)						
State of exploitation	?	?	?	?	?	?

Utilization : Marketed fresh fish; Salted and also boiled. The row is often marketed as salted product.

Sources : FAO, 1974b.; and MFRD, 1996a., 1996b.

Family : Nemipteridae

Species name : *Nemipterus hexodon* (Quoy & Gaimard, 1824)

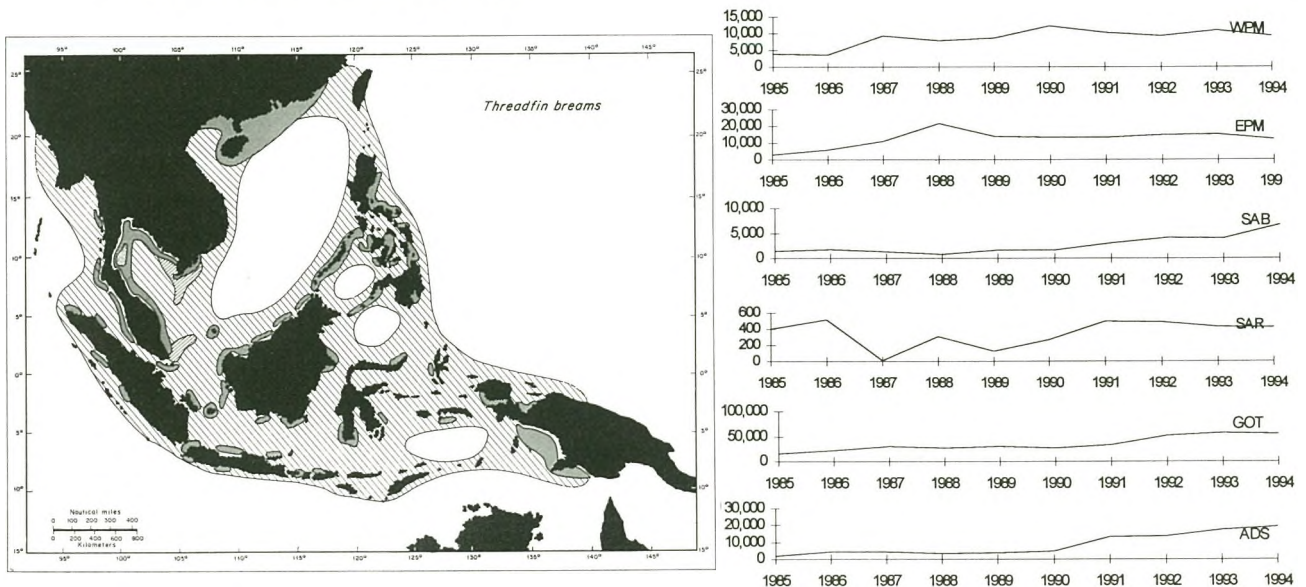
Characteristic : The theadfin and monocle breams are remarkable in its uniformity of the number of dorsal and anal finrays, all have X, 9 and III, 7 respectively. The orbital with single flat spine ; the second suborbital with a Russell (1990) reviewed the family, 5 genera and 64 species free margin were recognized, 17 species of 4 genera were found in Sub-survey. *Nemipterus hexodon* (Quoy & Gaimard, 1824) Sub-orbital depth, pectoral fins long, caudal fin forked; upper lobe slightly longer than lower; 3 or 4 pair of small recurved canines anteriorly in upper jaw. Maximum size 21 cm SL., commonly 15 cm SL.



Colour: upper part of body pinkish, paling to silvery white on ventral surface; 6 to 8 pale yellow stripes on sides from below lateral line; blood red, ovoid spot below origin of lateral line, bordered below by bright yellow; yellow stripe on either side of ventral midline, golden reflections behind eye, on cheeks and opercle, dorsal fin translucent whitish, with a yellow margin; a narrow yellow stripe beginning anteriorly near base of fin and extending backwards to just above midposterior margin, caudal fin pinkish, upper lobe tipped with yellow, anal fin translucent, pectoral and pelvic fins pale translucent pink; base of pelvic fins and axillary scale lemon-yellow.

Biological and Distribution : Distributed throughout Indo-West Pacific. Demersal, distributing a long coastal area to 60 m. Small fish inhabit near to shore than the bigger size. Carnivorous, food is polychaetes, shrimps, cephalopods, molluse, juvenile fish.

Fishing gears : Common in trawl catch from South China Sea and Andaman Sea and lines. The main fishing gear is trawler. Trawl, South China Sea, 67 m.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	3,486	3,082	800	7	15,358	1,738
Maximum catches (tons)	12,231	21,503	6,675	497	57,903	19,260
Average catches (tons)	8,481	12,410	2,609	345	34,994	8,531
MSY (tons)					21,697	5,909
State of exploitation	M	F	F	M	F	F

Utilization : Comminuted (Raw material for surimi), Dried, Steam & deep-fried, Fish meal, Powdered.

Sources : FAO, 1974c., 1996., 1997; Bhatiyasevi, 1997.; and MFRD, 1996a., 1996b.

Family : Polynemidae

Species name : *Eleutheronema tetradactylum* (Shaw, 1804)

Characteristic : Body more or less elongate and compressed.

Snout projecting, mouth very large, with small teeth.

Lips absent except for lower lip near corner of mouth.

Eyes large. Pectoral fin in two parts, upper part with

all rays unbranched, lower with 4 free filamentous

rays of which the upper filament is the longest,

reaching to pelvic fin base; caudal fin forked with

lobes equal. Scales small, ctenoid (rough to touch).

Colour : Body silvery green above, cream below;

dorsal and caudal fins grey, dusky at edges, pelvic

and anal fins orange, pectoral filamentous rays white.

Biological and Distribution : Throughout northern part of

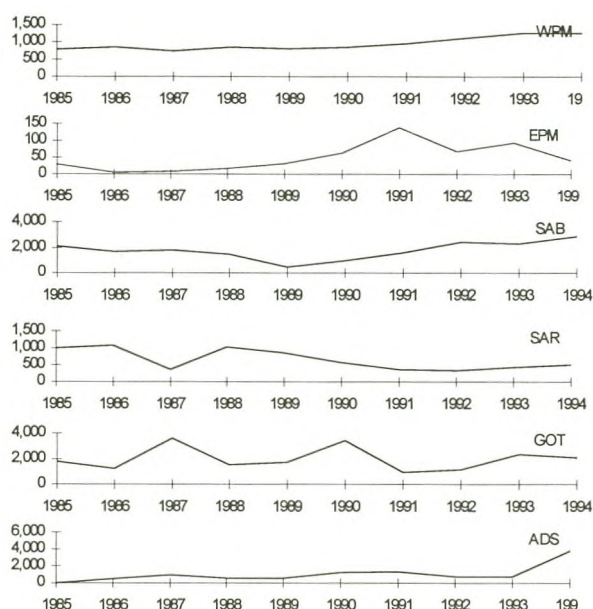
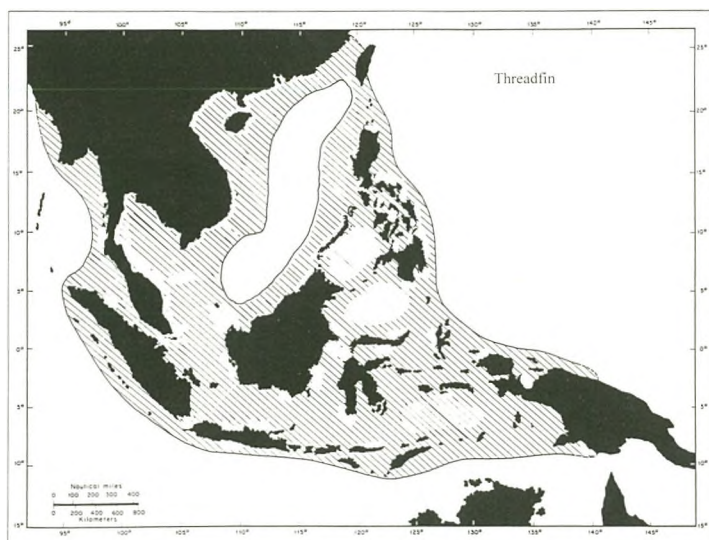
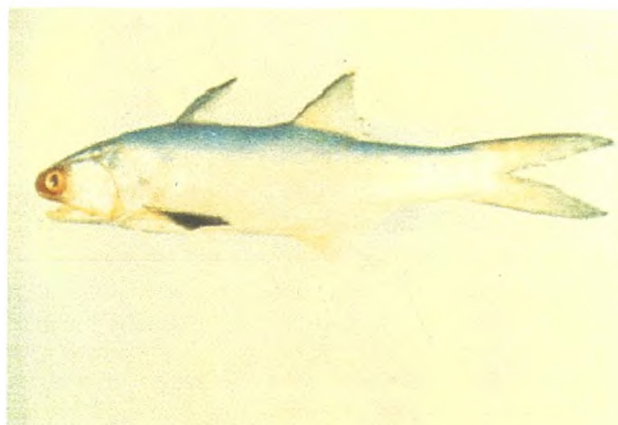
area and southward to Queensland (Australia); also,

west coasts of India. Lives mainly over shallow

muddy bottoms in coastal waters; also enters rivers.

Feeds mainly on small crustaceans and fishes. This species are the largest of threadfins.

Fishing gears : Caught in shallow coastal waters and lower reaches of larger rivers. The main fishing gear is beach seines, longlines, traps, gill nets and trawls.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	778	4	462	336	946	28
Maximum catches (tons)	1,272	139	2,860	1,018	3,635	3,811
Average catches (tons)	952	49	1,754	650	1,979	1,059
MSY (tons)						
State of exploitation	?	?	?	?	?	?

Utilization : Marketed fresh, Frozen, Comminuted (Fish sauce), Dried and Fish meal.

Sources : FAO, 1974a.

Family : Priacanthidae

Species name : *Priacanthus tayenus* Richardson, 1846

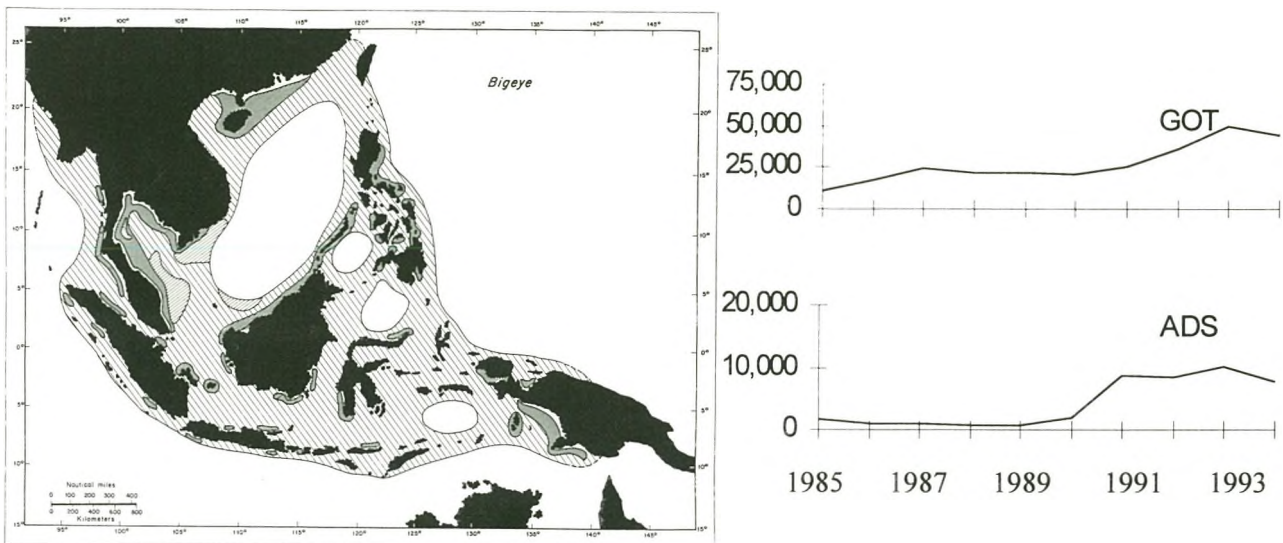
Characteristic : preopercular spine long and slender.

Body colour silver-red. Fourth and 5th dorsal rays produced in young specimen; anal fin deeply emarginate with pointed lobes. Ventral fins with numerous brown blotch of various sizes.

Biological and Distribution : Bigeye is a carnivorous. Its food are fish, shrimp and squids. Gulf of Thailand, distributed in the west coast of the Gulf at deeper than 40 m. It is normally found 4.0-30.0 cm long. The growth rate (K) of male and female are 2.11 and 1.96 per year, and $L_a = 28.7$ and 25.0 cm respectively. The peak of spawning season is during January to March. They spent 56,000-152,000 eggs at a time. Usual size 15 - 20 cm, attains 25 cm.



Fishing gears : The main fishing gear is otter board trawl, but for a small fish caught by shrimp trawl net in shallow waters. Deeper coastal waters, occurring frequently in trawl catch. landed in substantial numbers, but low-priced.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)					10,986	649
Maximum catches (tons)					49,710	10,129
Average catches (tons)					27,309	4,148
MSY (tons)					55,916	1,100
State of exploitation	?	?	?	?	M	O

Utilization : Fish meal and Comminuted (Frozen surimi and fish ball)

Sources : FAO, 1974c., 1996.; Bhatiyasevi, 1997.; and MFRD, 1996a., 1996b.

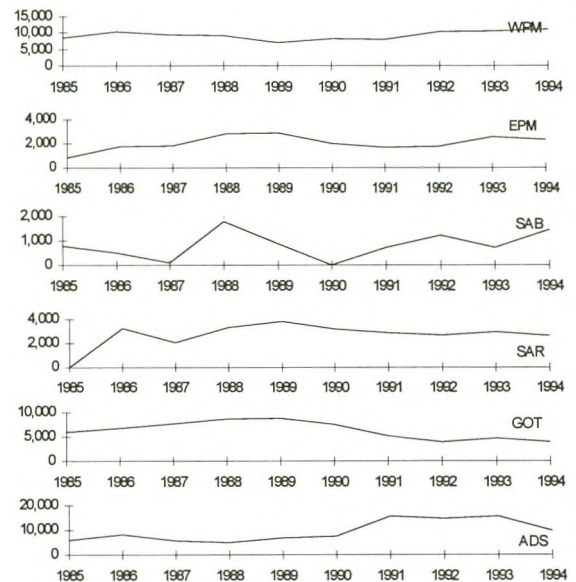
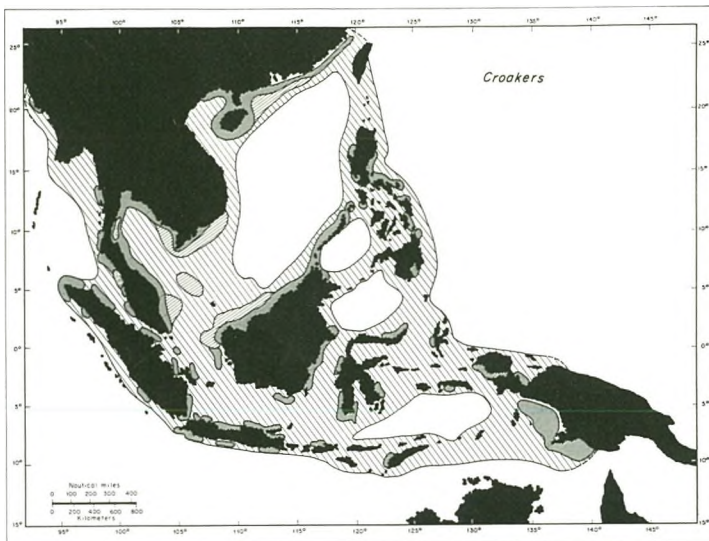
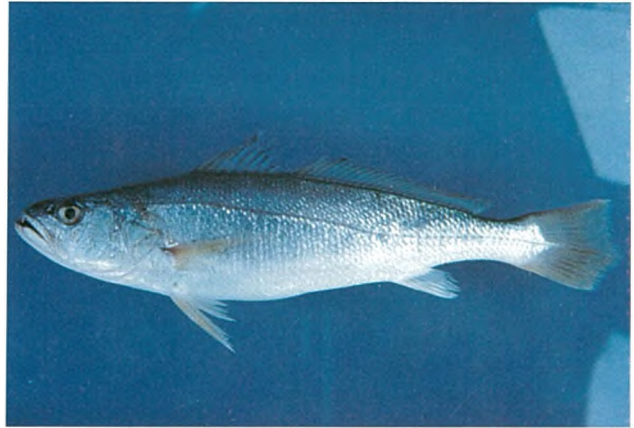
Family : Sciaenidae

Species name : *Pennahia macrophthalmus* (Bleeker)

Characteristic : Body oblong, slightly compressed. Depth 3.0 - 3.5. Mouth large, terminal, oblique. Large and small teeth in both jaws, no outstanding canines. Lower gill rakers 10 - 12. Swim bladder carrot-shaped with 18-22 pairs of appendages, the anterior ones not entering head. A notch on dorsal fin. Caudal fin truncate.

Biological and Distribution : Very abundant in trawl catch from coastal muddy waters, especially off Sarawak in the South China Sea and North Andaman Sea. Usual size 13 - 15 cm. Maximum 17 cm.

Fishing gears : Caught by trawlers



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	7,084	823	93	2,057	3,933	5,065
Maximum catches (tons)	11,070	2,904	1,780	3,786	8,740	15,773
Average catches (tons)	9,260	2,042	812	2,364	6,303	9,472
MSY (tons)						5,909
State of exploitation	?	?	?	?	?	M

Utilization : Dried, Comminuted (Raw material for surimi), Steamed & deep-fried, Small specimens are considered as trash fish, .

Sources : Bhatiyasevi, 1997.; and MFRD, 1996a., 1996b.

Family : Scombridae

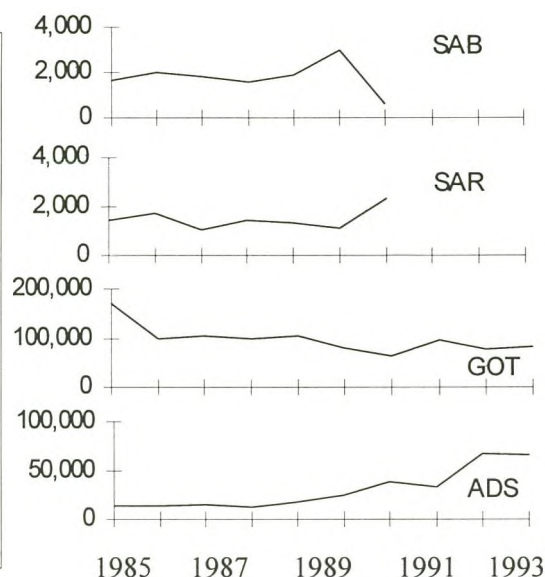
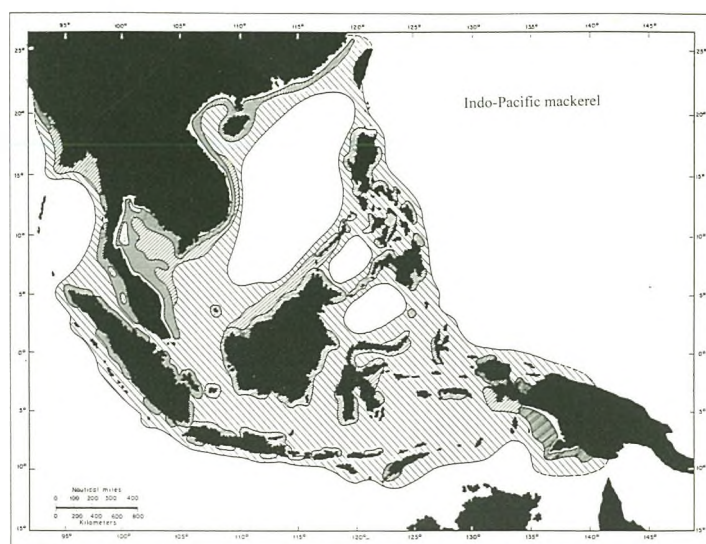
Species name : *Rastrelliger brachysoma* (Bleeker,1851)

Characteristic : The scombroids mackerels are characterized in having a streamline fusiform to elongate body; caudal peduncle keeled; caudal fin stiff, deeply fork or lunate; posterior dorsal and anal fins with 5-12 finlets. Collette & Nuan (1983) reviewed the family, over 25 species known from the South China Sea; 5 species found. For *Rastrelliger brachysoma* (Bleeker,1851) Body very deep, head equal to or less than body depth. Gillrakers very long, visible when mouth is opened. Intertine very long, 3.2 to 3.6 times fork length. Colour: spinous dorsal fin yellowish with a black edge, pectoral and pelvic fins dusky, other fins yellowish. Size: Maximum fork length is 34.5 cm, common from 15 to 20 cm.



Remark: *R. neglectus* is possibly not a synonym of this species but separated, the further study on the two species is needed.

Biological and Distribution : Central Indo-West Pacific. There are common, coastal pelagic species, often found in large school, feeding on phytoplankton. In the Gulf of Thailand, there scattering along the coastal areas; at 50 m deep or less. Spawns throughout the year, Indian Ocean the spawning period extends from March through September, while in the South China Sea, from January to March and June to August are the peak. Usual size 15 - 20 cm.



State of exploitation :

State of Catches (1985 - 1994)	MAL*				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)			580	1,050	64,156	12,122
Maximum catches (tons)			2,951	2,252	170,350	66,985
Average catches (tons)			1,779	1,493	97,489	30,198
MSY (tons)					94,791	24,453
State of exploitation	?	?	?	?	F	R

Utilization : Marketed fresh or cooked in brine, Cooked, Steamed, Deep-fried & asam and Boiled.

Sources : FAO, 1983.; MFRD, 1996a., 1996b.; and Saikiang & Boonragsa, 1997.

* Data catches included in Indian mackerel for WPM and EPM.

Family : Scombridae

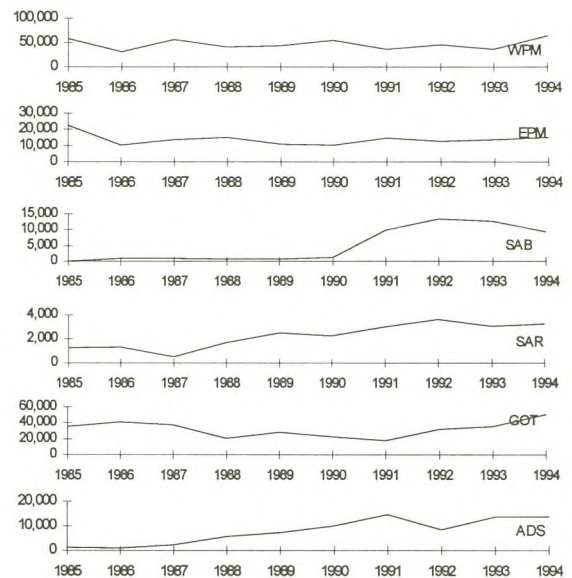
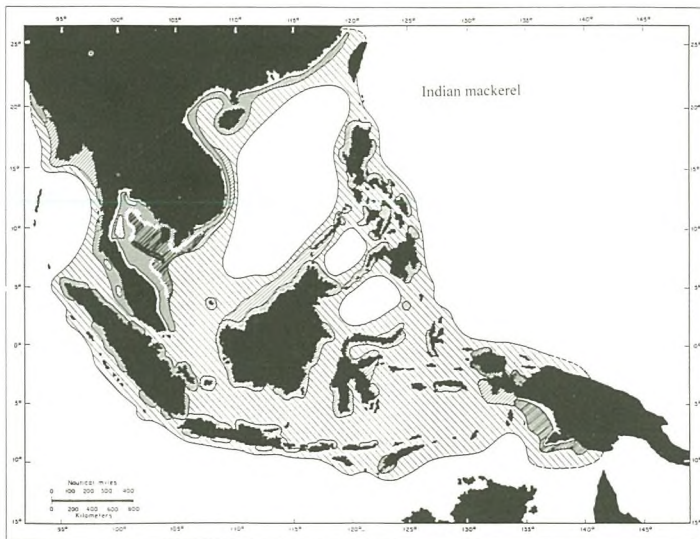
Species name : *Rastrelliger kanagurta* (Cuvier, 1817)

Characteristic : Body moderately deep. Maxilla partly concealed, covered by the lacrimal bone, gill rakers very long, visible when mouth is opened. Intestine 1.4 to 1.8 times fork length. Colour: narrow dark longitudinal bands on upper part of body (golden in fresh specimens) and a black spot on body near lower margin of pectoral fin; dorsal fins yellowish with black tips, caudal and pectoral fins yellowish; other fins dusky. Size: Maximum fork length is 35 cm, common to 25 cm.



Biological and Distribution : Widespread in the Indo-West Pacific. It's scatter off shore waters throughout the Gulf of Thailand where the depth over 50 m. The peak of spawning occurs in May-June, September-October in East Coast of Peninsular Malaysia; February-April, July-August in the Gulf of Thailand and December-February in Andaman Sea. An epipelagic, neritic and schooling species. Juveniles feed on phytoplankton and small zooplankton.

Fishing gears : Very common and abundant fish, caught mainly by purse seine (luring purse seine, Thai purse seine), encircling gill nets, pair trawl and bamboo stake traps (kelong), incidentally by trawl. Trawl South China Sea, 30 - 40 m.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	31,581	10,165	757	528	17,849	965
Maximum catches (tons)	55,285	22,372	13,337	3,610	50,898	14,709
Average catches (tons)	46,592	13,739	4,988	2,251	32,105	7,792
MSY (tons)		22,768			34,282	5,899
State of exploitation	?	M	?	?	D	M

Utilization : Comminuted, Marketed fresh or cooked in brine, Cooked, Steamed, Deep-fried, Curry & asam, Fish sauce, Fish-dry, Fish meal

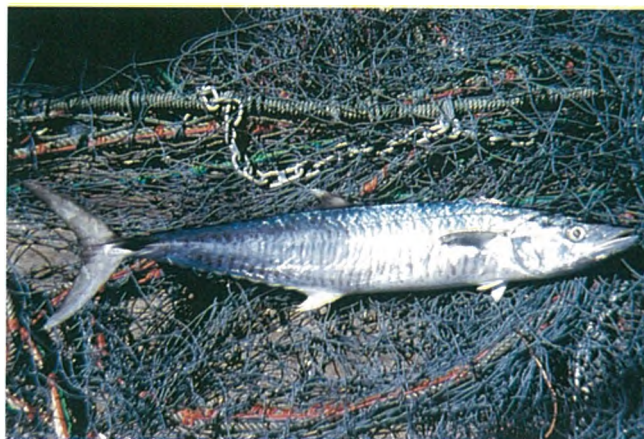
Sources : Anon, 1978; Fao, 1983., 1997.; Bhatiyasevi, 1997.; Mansor & Abdullah, 1995.; and Saikliang & Boonragsa, 1997.

* Indo-Pacific mackerel catches were included.

Family : Scombridae

Species name : *Scomberomorus commerson*
(Lacepede, 1800)

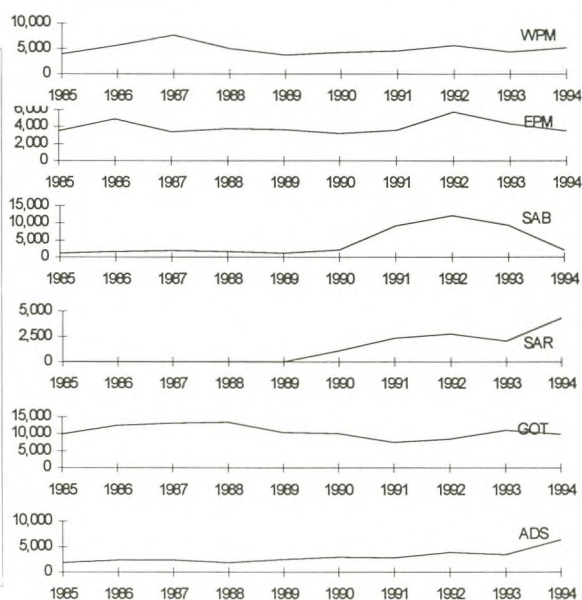
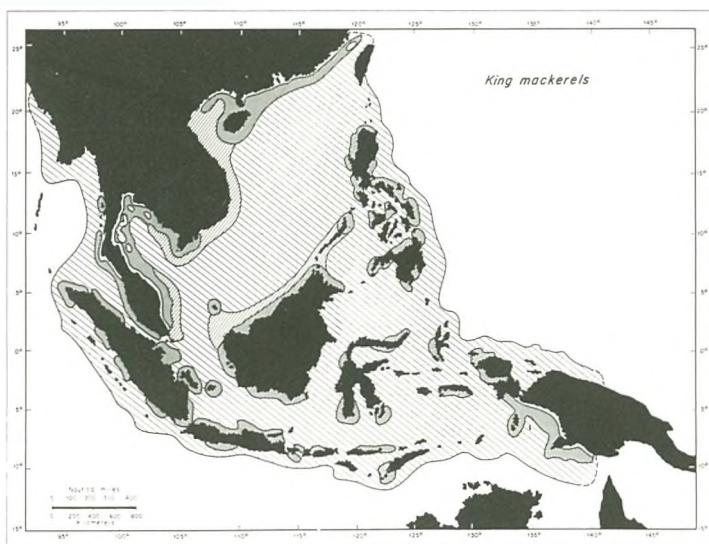
Characteristic : Body elongate, compressed, second dorsal and anal fins followed by 10-11 finlets. Gillrakers on first arch few. Lateral line abruptly bent downward below end of second dorsal fin. Colour: sides silvery grey marked with transverse vertical bars of a darker grey; bars narrow and slightly wavy, bars number 40 to 50 in adults, first dorsal fin bright blue rapidly fading to blackish blue; pectoral fin light grey turning to blackish blue; caudal fin lobes, second dorsal, anal, and dorsal and anal finlets pale greyish white turning to dark grey. Size: Maximum fork length is about 220 cm, common to 90 cm. Highly commercial species throughout its range.



***Scomberomorus guttatus* (Bloch & Schneider, 1801) :** Body moderately deep, strongly compress. Gillrakers on first arch moderate: 1 or 2 on upper limb. Lateral line with many fine auxillary branches extending dorsally and ventrally in anterior third, gradually curving down toward caudal peduncle. Colour: sides silvery white with several longitudinal rows of round dark brownish spots scattered in about 3 irregular rows along lateral line. First dorsal fin membrane black, pectoral, second dorsal and caudal fins dark brown; pelvic and anal fins silvery white. Size: Maximum fork length is 76 cm.

Biological and Distribution : Widespread throughout the Indo-West Pacific. And *S. guttatus* Distributed along the shores of continental Indo-West Pacific. Very common pelagic coastal fish, in good demand. Usual size 60 - 90 cm, attains 235 cm for *Scomberomorus commerson* and 35 - 55 cm for *S. guttatus*.

Fishing gears : The main fishing gear is mackerel drifting gill net, bamboo stake trap and trawler catching small fishes. Trawl, South China Sea, 30 - 40 m and North Andama Sea, 34 - 38 m.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	3,813	3,209	1,254	1,113	7,549	1,939
Maximum catches (tons)	5,222	5,679	12,288	4,330	13,319	6,473
Average catches (tons)	5,020	3,951	4,247	1,250	10,599	3,078
MSY (tons)					14,599	2,213
State of exploitation	?	?	?	?	U	M

Utilization : Canned, Dried, Comminuted (Deep-fried, fish ball, fish paste for "Yong tau foo" & otak-otak), Very popular food fish.

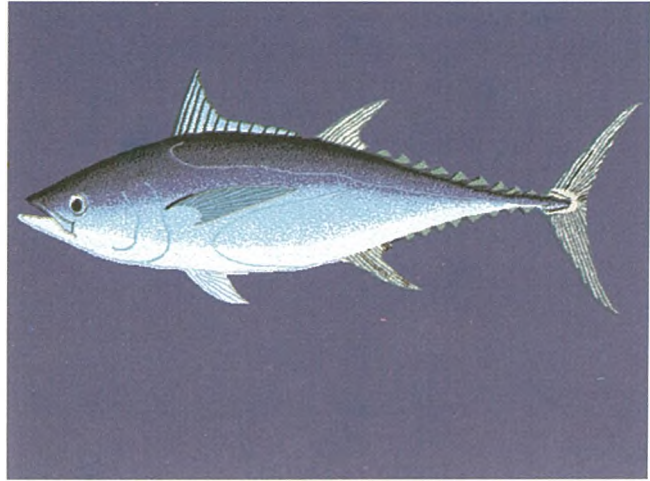
Sources : FAO, 1983.; MFRD, 1996a., 1996b.; and Saikiang & Boonragsa, 1997.

Family : Scombridae

Species name : *Thunnus tonggol* (Bleeker)

Common name : Longtail tuna

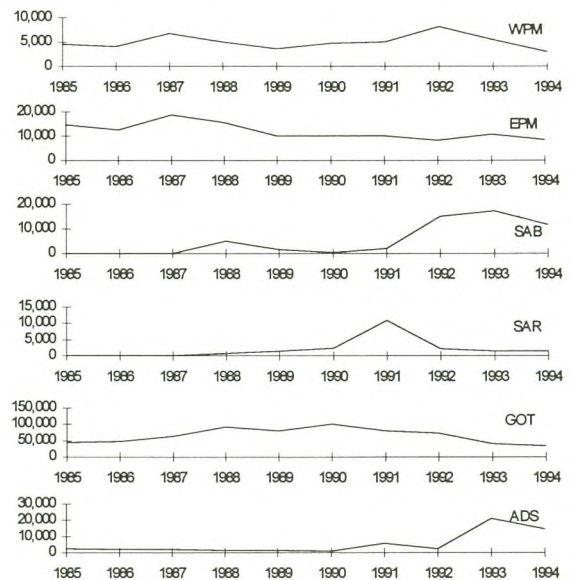
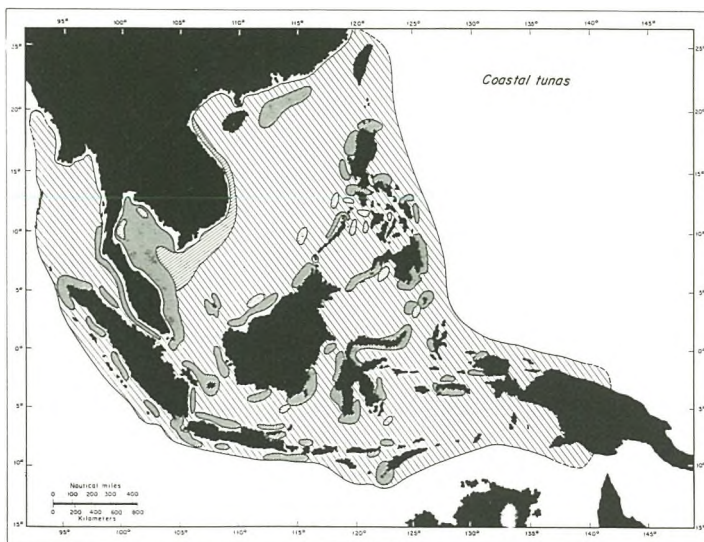
Characteristic : A small species, deepest near middle of first dorsal fin base. Second dorsal fin higher than first dorsal; pectoral fins short to moderately long. Swimbladder absent or rudimentary. Colour : lower sides and belly silvery white with colourless elongate oval spots arranged in horizontally oriented rows; dorsal, pectoral and pelvic fins blackish, tip of second dorsal and anal fins washed with yellow; anal fin silvery; dorsal and anal finlets yellow with greyish margins; caudal fin blackish, with streaks of yellowish green.



Biological and Distribution : Indo-West Pacific Ocean

and Indian ocean. An epipelagic, predominantly neritic species avoiding very turbid waters and areas with reduced salinity such as estuaries. Longtail tuna may form schools of varying size. Being an opportunistic feeder, its diet includes many species of crustaceans, cephalopods and fishes, at varying percentages. They are abundant and widely distributed almost over the Gulf and the peak of spawning is during March to May and July to December.

Fishing gears : Fishing gear comprise purse seine, king mackerel drift gill net, trolls and longlines.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	2,939	8,002	305	810	32,006	1,039
Maximum catches (tons)	8,194	18,765	17,136	10,822	101,397	21,011
Average catches (tons)	5,027	11,831	5,271	2,073	65,240	5,374
MSY (tons)				45,000	86,000	8,651
State of exploitation	?	?	?	U	O	M

Utilization : Canned, Frozen, Cured, Comminuted, Smoked and Marketed fresh fish.

Sources : Bhatiyasevi, 1997.; FAO, 1983.; Cheunpan, 1993.; Gambang, 1997.; and MFRD, 1996a., 1996b.

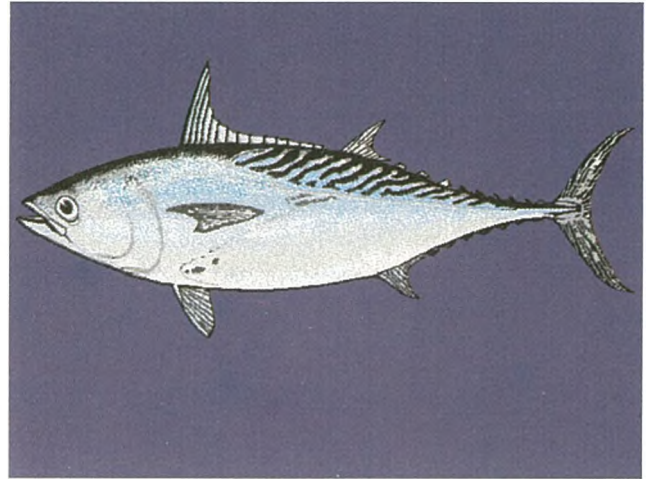
Family : Scmbridae

Species name : *Euthynnus affinis* (Cantor, 1849)

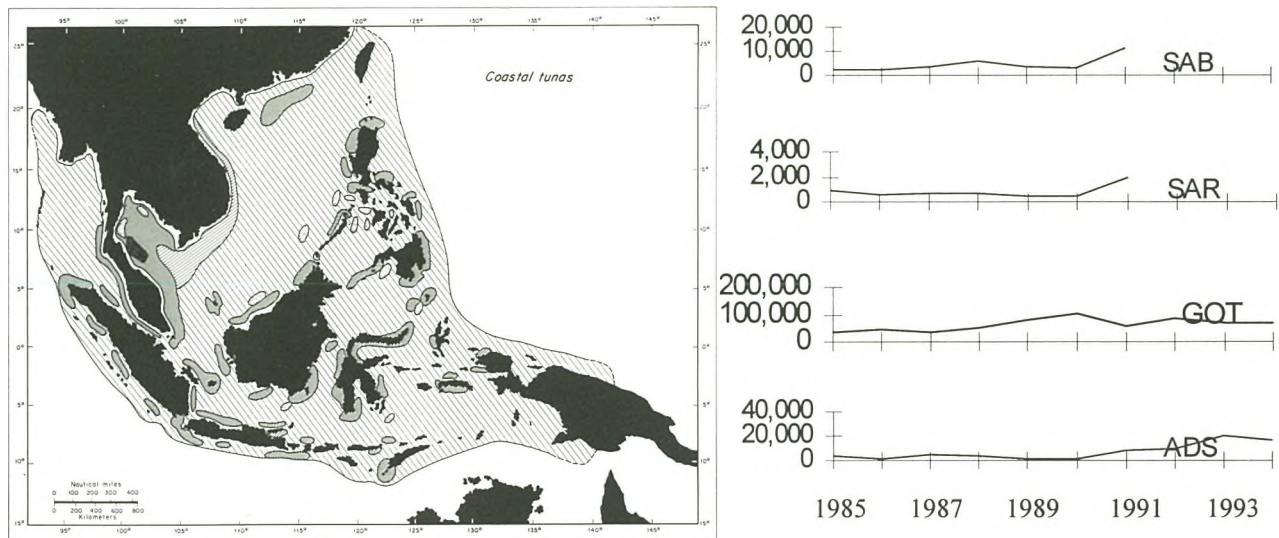
Common name : Kawakawa, Eastern little tuna

Characteristic : Gillrakers 29 to 33 on the first arch; gill teeth 28 or 29; vomerine teeth absent. Anal fin rays 13 or 14. Vertebrae 39; no trace of vertebral protuberances; bony caudal keels on 33rd and 34th vertebrae. Colour : dorsal marking composed of broken oblique stripes.

Biological and Distribution : Throughout the warm waters of the Indo-West Pacific, including oceanic islands and archipelagos. A few stray specimen have been collected in the Eastern Tropical Pacific. An epipelagic, neritic species inhabiting waters temperatures ranging from 18 - 29 °c. They are abundant and widely distributed almost over the Gulf. The peak of spawning season is during January- March and June-September in the gulf of Thailand. Common length is 60 cm.



Fishing gears : The main fishing gear is purse seine; king mackerel drift gill net and lift nets.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA*	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)			2,126	452	32,477	1,039
Maximum catches (tons)			10,990	1,994	101,397	19,773
Average catches (tons)			4,493	829	62,284	6,971
MSY (tons)					86,000	
State of exploitation	F	M	M	M	M	F

Utilization : Canned, Frozen, Smoked, Cured and Comminuted.

Sources : FAO, 1983.; 1997., and MFRD, 1996a., 1996b.

* = Eastern little tuna and Frigate tuna were included.

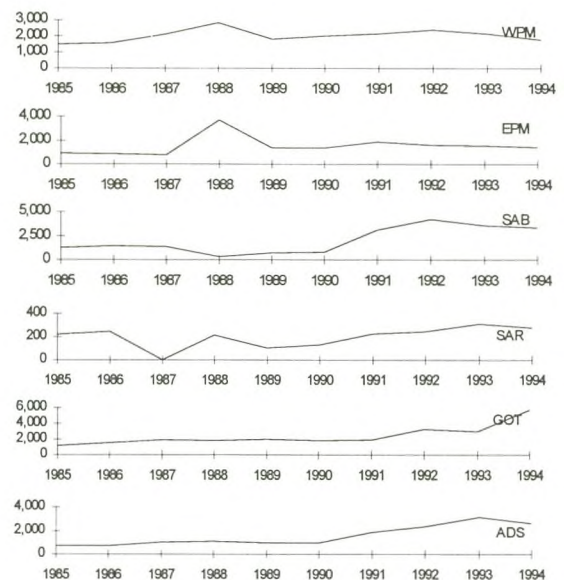
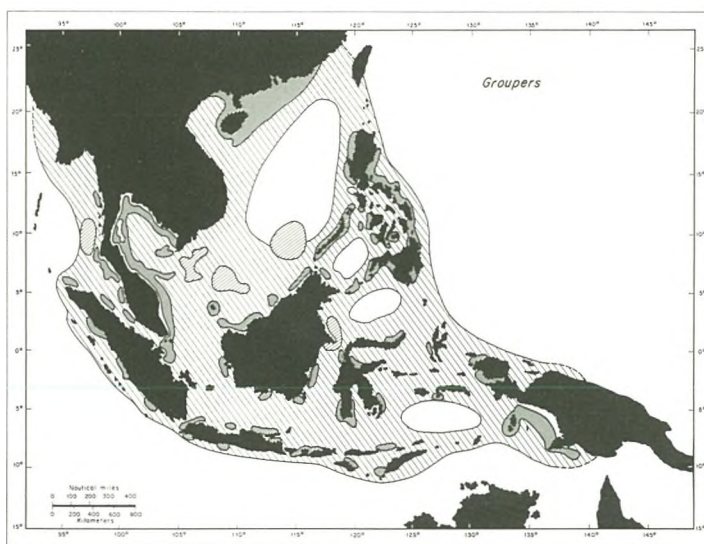
Family : Serranidae

Species name : *Epinephelus areolatus* (Forsk.)

Characteristic : Body slender, moderately compressed. Depth 3.0-3.5. Dorsal with 11 spines. Caudal fin truncate to emarginate. Ground colour brown covered by large hexagons dark spots, usually darker on fins. Solf dorsal, anal, and caudal with a white margin.

Biological and Distribution : Coastal to deep waters, inhabits shallow waters of coral and rocky areas. Feeds on bottom-living crustaceans and fishes. Common size 20 - 30 cm, maximum 40 cm.

Fishing gears : Caught by trawls, traps, bottom long lines and hand-lines. Trawl, South China Sea, 47-49 m.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	1,588	774	320	104	1,177	720
Maximum catches (tons)	2,811	3,677	4,191	278	5,679	3,089
Average catches (tons)	2,026	1,519	1,995	197	2,386	1,539
MSY (tons)						
State of exploitation	?	?	?	?	?	?

Utilization : Common and popular in market, Frozen, Steamed & deep-fried

Sources : FAO, 1974d.; and MFRD, 1996a., 1996b.

Family : Sillaginidae

Species name : *Sillago sihama* (Forsskal, 1775)

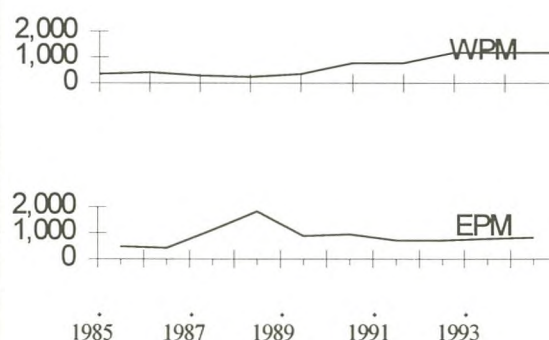
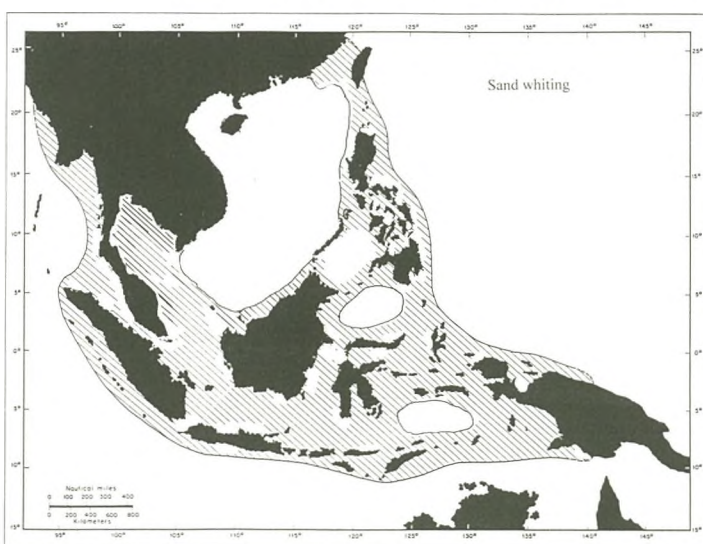
Synonyms : *Sillago acuta* Cuvier, 1817:258 (Sea of the Indies)

Characteristic : First dorsal fin with IX spines and second dorsal fin with I spine and 20 to 23 soft rays; anal fin with II spines and 21 or 23 soft rays. Lateral-line scales 66 to 72; Body colour is light tan, silvery yellow-brown, sandy brown, or honey coloured; paler brown to silvery white below; a midlateral, silvery, longitudinal stripe normally present; dorsal fins dusky terminally with or without rows of dark brown spots on the second dorsal fin membrane; caudal fin dusky terminally; other fins hyaline. The family was reclassified by McKay (1992), two genera and 9 species known from the South China Sea, 3 species found.



Distribution : Sillaginids are bottom feeding, schooling, carnivorous, coastal fisheries, inhabiting open sandflats, muddy substrates and nearshore along beaches subject to moderately strong wave action. Some species enter estuaries and even penetrate fresh water for considerable periods, despite the absence of renal corpuscles in the kidney (Nadkarni, 1963). Shallow water of a few centimetres may be inhabited by juvenile sillaginids, especially in the vicinity of mangroves or seagrass beds and other species are trawled to depths exceeding 180 m. Fecundity varies between 16,682 and 166,130. The size at first maturity is much larger (235 mm for females and 224 mm for males) than that reported by Radhakrishnan (1954). A wide ranging species throughout the Indo-West Pacific Region; Singapore; Thailand; Philippines. Six species were found in Thai Waters.

Fishing gears : Taken by seine net and cast net in the mouths of estuarine and along coastal beaches in bays. Small local fisheries exist throughout the range of this species, particularly where bottom trawls are employed. The species of sillaginids trawled in slightly deeper waters offshore are frequently different from those species taken in nearby inshore areas by beach seine or castnet. In contrast to shallow coastal marine populations of the same species, estuarine populations may be darker in coloration with black edging to the caudal fin, snout and side of the body. It is very rarely captured by prawn trawling vessels.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	215	438				
Maximum catches (tons)	1,195	1,812				
Average catches (tons)	670	874				
MSY (tons)						
State of exploitation	?	?	?	?	?	?

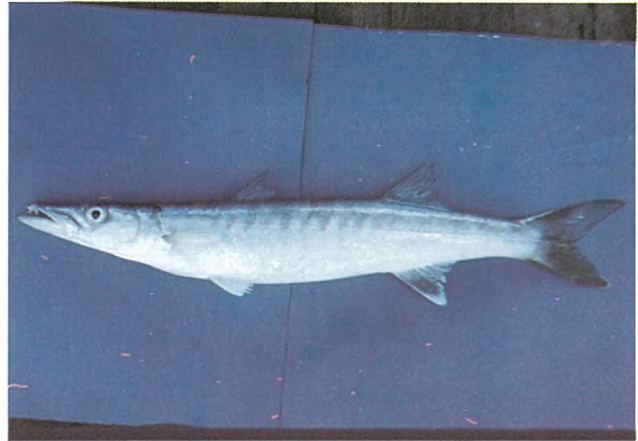
Utilization : Fresh fish

Sources : FAO, 1992.; MFRD, 1996a., 1996b.; and Sirimontaporn & Choonhaparn, 1995.

Family : Sphyraenidae

Species name : *Spyraena jello* Cuvier, 1829

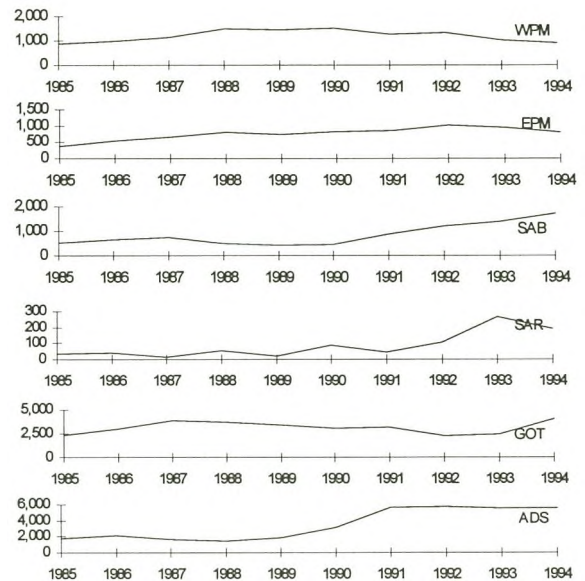
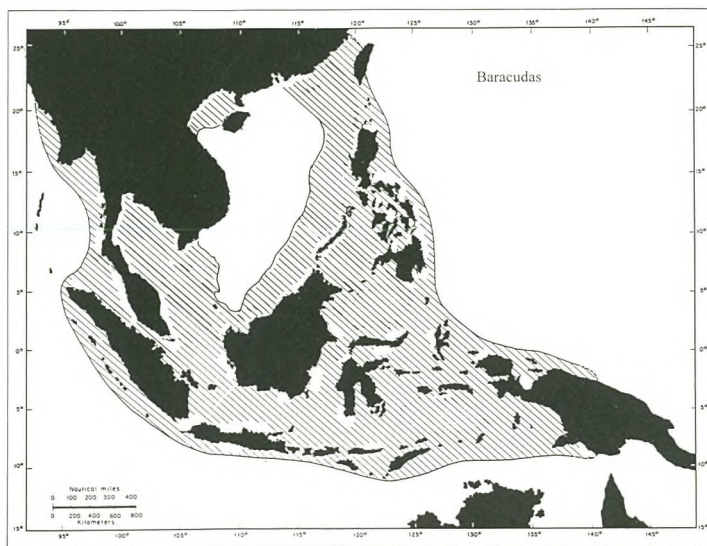
Characteristic : Lateral line scales 130-140; eye not large; conner of preopercle rounded, without a membranous flap; opercle with two flexible flat spines; no pointed cartilaginous knob at front of lower jaw; maxilla reaching to below front edge of eye; teeth erect; origin of first dorsal fin slightly posterior to origin of pelvic fins and anterior to tip of pectoral fins; caudal fin deeply fork, without inner lobe; dusky blue-green on back, silvery on sides, with about 20 dark bars on body about equal in width to pale interspaces, those posterior to second dorsal and anal fins faint; caudal fin yellow. Reaches about 140 cm.



Biological and Distribution : Red Sea and coast of East

Africa to the Western Pacific. Sometimes appear in large schools near the surface. Reputed to be dangerous, attacking swimmers in coastal waters. Usual size 50 - 100 cm, attains 150 cm. Feeds predominantly on fishes and often swims near the surface.

Fishing gears : Very common in coastal waters, caught with trawl, hook & lines, trolling lines and set nets. Trawl, South China Sea, North Andaman Sea, 62 - 64 m, 40 - 44 m respectively



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	861	370	433	14	2,261	1,607
Maximum catches (tons)	1,488	1,015	1,699	265	4,011	5,669
Average catches (tons)	1,193	753	847	86	3,120	3,420
MSY (tons)						2,407
State of exploitation	?	?	?	?	M	F

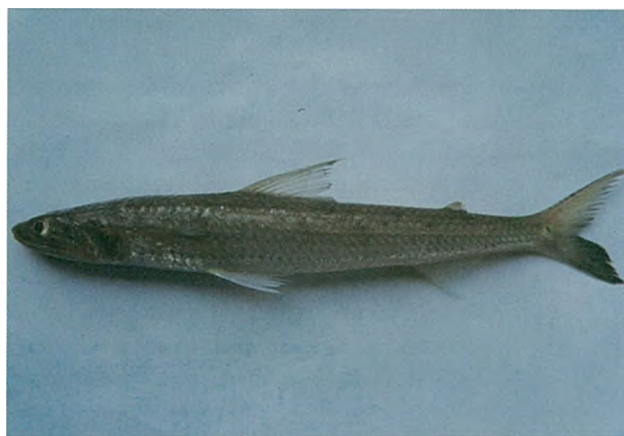
Utilization : Marketed fresh, Soup, Fillet or cultet, Cured, Dried and Fermented.

Sources : FAO, 1974d.; Bhatiyasevi, 1997.; and MFRD, 1996a, 1996b.

Family : Synodontidae

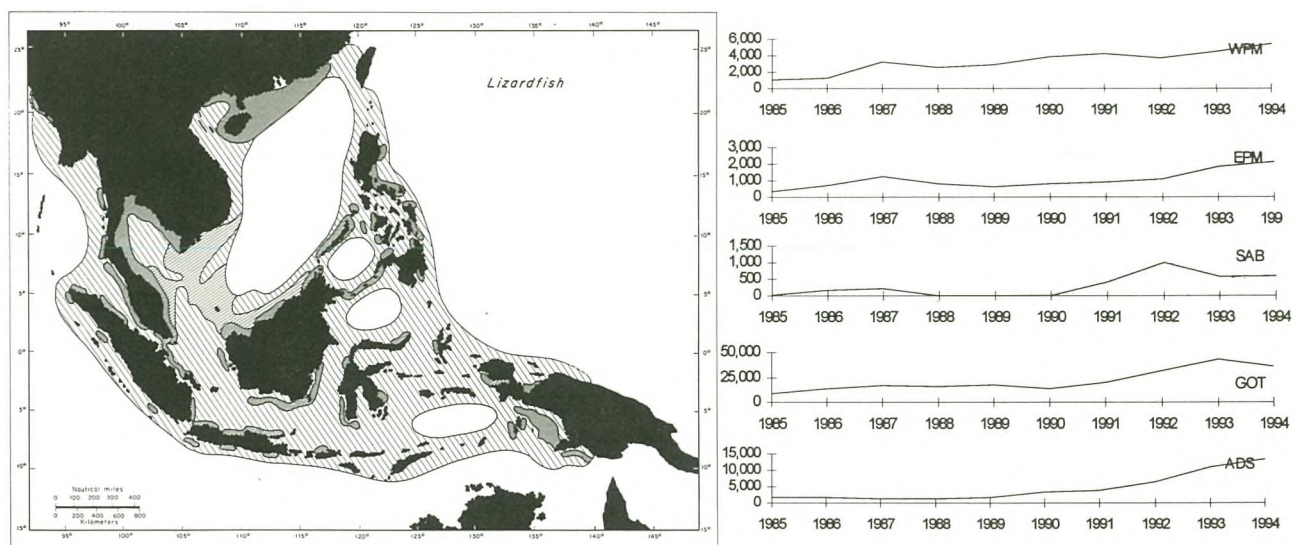
Species name : *Saurida undosquamis* (Richardson, 1842)

Characteristic : Lizardfishes are aptly named for their reptile-like head; large mouth and numerous needle-like teeth; body cylindrical; no spine in the fins; high dorsal fin, small adipose fin; pelvic fin are large, caudal fin fork. Three genera and 6 species were found. The characteristic of *Saurida undosquamis* (Richardson, 1842) are body plain olive brown above, silvery white below; upper edge of caudal fin with row of 4 to 9 black checks. Pectoral fin reaching ventral fin original when laid toward it. Two rows of teeth on anterior part of outer palatine tooth band.



Biological and Distribution : Brushtooth lizard (*S. undosquamis*) and lizardfish (*S. elongata*) are most abundant in Thai waters. Common in shallow muddy areas. Lives over muddy bottoms of the continental shelf, down to about 60 m. Usual size 25 - 30 cm, attains 40 cm. Breeds throughout the year. Carnivorous, feeds on bottom-living invertebrates and fishes, small fish and pony fish in particular. Small fish is caught at shallower water as compared to bigger fish.

Fishing gears : Caught with bottom trawl, South China Sea, 62 - 74 cm.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	1,058	332	25	0	8,519	1,085
Maximum catches (tons)	5,469	2,145	989	0	42,486	11,068
Average catches (tons)	3,270	1,056	295	0	21,455	4,517
MSY (tons)					21,303	
State of exploitation	M	M	M	M	D	U

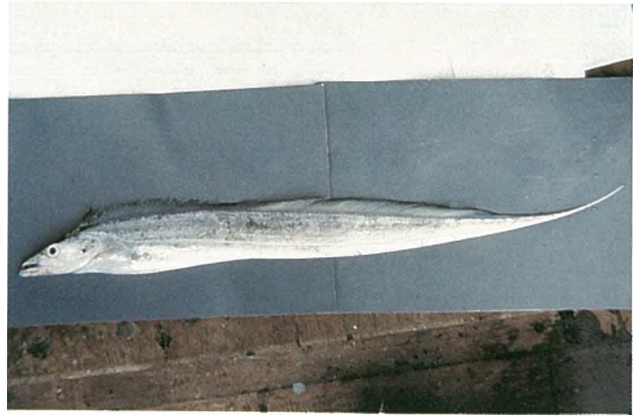
Utilization : Dried, Marketed fresh, Comminuted (used in making fish balls, surimi), Powdered (fish cake, any fish based product).

Sources : FAO, 1974d., 1996.; and MFRD, 1996a., 1996b.

Family : Trichiuridae

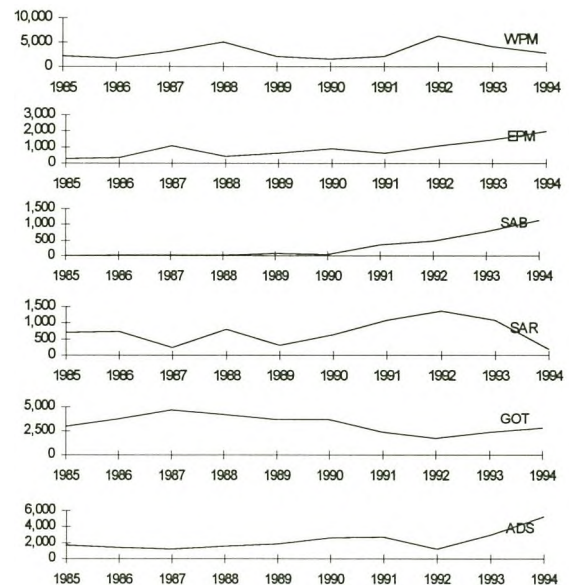
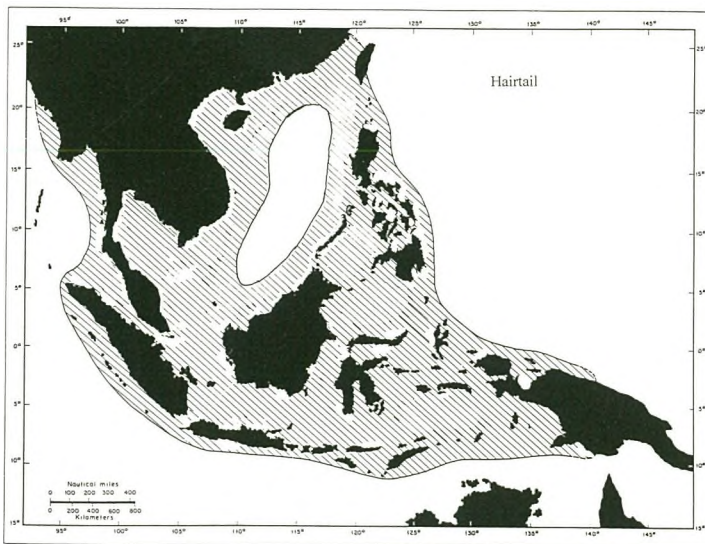
Species name : *Trichiurus lepturus* Linnaeus, 1758

Characteristic : The hairtail or cutlassfish is the close related family to the scombrids; characterized by the very long, extremely compressed, silvery body; mouth large with long, copress canine teeth on jaws; caudal fin small or filamentous. Nakamura & Parin (1993) revised the family and their relatives; at least 5 species known in this region, 3 species found. For the *Trichiurus lepturus* Linnaeus, 1758 : Body extremely elongate and strongly compressed, ribbon-like, tapering to a point, position of anus nearer snout than posterior tip of body, eye large, 2 or 3 pairs of enlarged fangs with barbs nearer tip of upper jaw. Dorsal fin rather high and long, pelvic and caudal fins absent. Colour: steel blue with silery reflection, pectoral fins semi-transparent, other fins sometimes tinged with pale yellow. Size: Maximum 120 cm total length, common from 50 to 100 cm. This species isthe most important commercially caught triciurid.



Biological and Distribution : Throughout tropical and temperate waters. Coastal waters, both bottom-living and pelagic. Occurs to depths of at least 100 m, but usually shallow. Enters estuaries and may be found in extremely shallow water. Feeds on crustaceans, cephalopods and fishes.

Fishing gears : The main fishing gear is trawlers. trawl, South China Sea, 55 - 64 m, drift gill net, hook & lines (Philippines),.hand lines and pair trawl.



State of exploitation :

State of Catches (1985 - 1994)	MAL				THA	
	WPM	EPM	SAB	SAR	GOT	ADS
Minimum catches (tons)	1,694	267	5	177	1,741	1,239
Maximum catches (tons)	6,243	1,983	1,128	1,365	4,674	5,278
Average catches (tons)	3,089	874	293	707	3,221	2,264
MSY (tons)						
State of exploitation	?	?	?	?	?	?

Utilization : Common and popular food fish, Comminuted (Surimi, Fish ball), Deep-froed and Dried.

Sources : FAO, 1974d.; and MFRD, 1996a., 1996b.